










| BINDING LIST FEB 15 1928







# ORAL HEALTH



Digitized by the Internet Archive  
in 2011 with funding from  
University of Toronto

<http://www.archive.org/details/oralhealth11toro>







# ORAL HEALTH

---

VOLUME XI.

1921.

---

EDITOR:

Wallace Seccombe, D.D.S., F.A.C.D., Toronto, Canada.

---

CONTRIBUTING EDITORS:

C. N. Johnson, M.A., D.D.S., F.A.C.D. .... Chicago  
Richard G. McLaughlin, D.D.S. .... Toronto  
Major W. E. Cummer .... Toronto  
J. Wright Beach, D.D.S. .... Buffalo, N.Y.  
Burton Lee Thorpe, D.D.S., M.D. .... Pasadena, Cal.

---

DEPARTMENTS

TO THE DENTAL PROFESSION:

C. N. Johnson, M.A., D.D.S., F.A.C.D., Chicago.

---

MULTUM IN PARVO:

C. A. Kennedy, D.D.S., Toronto, Canada.

---

THE COMPENDIUM:

Thomas Cowling, D.D.S., Toronto, Canada.

---

Published by

ORAL HEALTH PUBLISHING CO.

Toronto, Canada.





# Index---Vol. XI., 1921

	Page		Page
<b>PHOTOGRAPHS.</b>			
Anderson, G. R., M.A., Toronto	200	Cameron, Dora L., Wenatchee,	
Black, Arthur D., A.M., M.D.,		Wash. ....	379-391
D.D.S., Sc.D., Chicago, Ill.	122	Cecil, George .....	349
Box, Harold K., L.D.S., D.D.S.,		Chubb, Gilbert, D.Sc., M.B.,	
Ph.D., Toronto .....	240	F.R.C.S. ....	66
Gilmer, Thomas F., D.D.S.,		Clay, John W., D.D.S., Cal-	
Chicago, Ill. ....	381	gary, Alta. ....	368-379
Hall, Rupert E., D.D.S., Chi-		Cowling, Thos., D.D.S., To-	
cago, Ill. ....	281	ronto .....(See Compendium)	
Johnson, C. N., M.A., L.D.S.,		Cummer, W. E., D.D.S., To-	
D.D.S., Chicago, Ill. ....	160	ronto .....	279-319-397
Knapp, K. W., D.D.S., Des		Gibson, Arnold E., D.D.S. ....	346
Moines, Iowa .....	42	Guedel, A. E., M.D., Indian-	
Lindsay, Dr. Ashley W., China	396	apolis, Ind. ....	212
Molt, Frederick F., D.D.S., Chi-		Harms, H. B., D.D.S., Omaha,	
cago, Ill. ....	82	Neb. ....	264
Officers, Committee and Clin-		Harper, Dr. W. E., Chicago,	
icians of the Washington,		Ill. ....	401
Oregon and British Colum-		Hensel, Chas. H., M.D. ....	225
bia Dental Asosciations ...	358	Hovestadt, J. F., D.M.D. ....	195
Yale-Cariboo Dental Society..	2	Huys, Dr. F. ....	453
<b>CONTRIBUTORS.</b>			
Amy, W. B., D.D.S., Toronto.	444	Johnson, C. N., M.A., D.D.S.,	
Anthony, L. Pierce, D.D.S.,		L.D.S., Chicago, Ill... 35-75-116-	
Philadelphia, Pa. ....	344	154-161-191-234-315-353-	
Beattie, J. W., R.C.A., Toronto	447	389-428-462	
Bier, E. Roy, D.D.S., Winni-		Johnson, K. M., D.D.S., Winni-	
peg, Man. ....	363	peg, Man. ....	342
Bothwell, J. A., D.D.S., To-		Kennedy, C. Angus, D.D.S.,	
ronto . . . . .	173	Toronto .....	359
Box, H. K., L.D.S., D.D.S.,		Knapp, K. W., D.D.S., Des	
Ph.D., Toronto .....	241	Moines, Iowa .....	43
Bremner, Geo. P. ....	198	Le Gro, A. L., D.D.S., Detroit,	
Bryce, P. H., M.D. ....	3	Mich. ....	123
Butler, Harry B. ....	143	McCaughy, S. G., D.D.S., Ot-	
Caine, A. M., D.D.S., New		tawa .....	136
Orleans, La. ....	68	McGehee, W. H., D.D.S. ....	68
		McKesson, Dr. E. I., Toledo,	
		Ohio .....	32

# INDEX—(Continued)

	Page		Page
Molt, Frederick F., D.D.S., Chicago, Ill. ....	83	Ebbing Year, The .....	462
Oberg, A. T., D.D.S., Van- couver, B.C. ....	376	Evolution of the Periodontal Pus-Pocket, The .....	241
O'Neill, J. G., D.D.S., Port Arthur .....	338	Fixed Bridgework, The Pros and Cons of .....	92
Pare, J. W., M.D., Toronto ...	309	Hall Method for Entire Upper and Lower Dentures ...	279-319
Parker, C. W., D.D.S., Regina, Sask. ....	382	Hall System of Anatomical Articulation (Rest and Oc- clusal Bites) .....	397
Pennycuik, R. S., B.D.Sc., L.D.S. ....	370	In Appreciation .....	379
Prinz, Herman, D.D.S., M.D..	69	Income Tax Regulations as Applied to Dentistry .....	136
Read, Charles, L.R.C.P., L.R. C.S. (Edin.), L.D.S. (Glas.)	174	It Is All Wrong .....	389
Riddell, Hon. W. R., LL.D., Toronto .....	257	Jacket Crown, Its Limitations and Uses, The .....	123
Seccombe, Wallace, D.D.S., To- ronto .....	201	Dr. C. N. Johnson, In Honor of	168
Smith, T. Sidney, D.D.S., San Francisco, Cal. ....	433	Leakage of X-Ray Tube Shields	368
Snell, Calvin, D.D.S., Toronto	171	Milwaukee Convention, The..	342
Thomson, George Kerr, D.D.S., L.D.S., Halifax, N.S. ....	107	Need and Value of Practical Demonstration and Actual Work to Acquire Skill and Success in Our Amalgam Work, The .....	401
Thornton, A. W., L.D.S., D.D.S., Montreal, P.Q. ....	92	Neuralgias in Their Relation to Neuroses .....	3
Wellermore, J. O., D.D.S., Min- neapolis, Minn. ....	63	New Era in Dentistry, The....	338
Wright, W. W., D.D.S., Winni- peg, Man. ....	383	Once More, the Pulpless Tooth	75
		Oral Infections and Their Treatment .....	433
		Oral Foci of Infection, The Elimination of .....	83
		Patient's Point of View, The.	428
		Present Day Tendencies To- wards Extraction .....	444
		Present Influences in Den- tistry, Some of the.....	162
		Preventive Dentistry, A Mes- sage on .....	171
		R. C. D. S., Graduation Ad- dress ....	257
		Rural Health Caravans and Pre-School-Age Dental Clin- ics .....	107
		Some Things a Dental Prac- titioner Should Know About Orthodontia to Best Serve His Patient .....	359
 ORIGINAL COMMUNICATIONS.			
After the Vacation .....	353		
Chicago to California and Re- turn .....	116-154-191-234		
Color as Applied to Dentistry.	447		
Danger Signals in Nitrous Oxide Oxygen Anesthesia..	363		
Dental Activities in Chicago.	35		
Dental Nomenclature .....	344		
Definite Standardized Tech- nique for Casting Inlays and Other Small Dental Cast- ings, A .....	43		
Dental Treatment and Nation- al Health- .....	23		
Diet in Relation to Oral Hy- giene .....	201		

# INDEX—(Continued)

	Page
There Were Two .....	315
University, Dalhousie—Graduates in Faculty of Dentistry	223
University of Montreal, Faculty of Dentistry Graduates, 1921 .....	181
What Next? .....	391

## SELECTED ARTICLES.

Abuse Prohibits Use—A Quotation .....	36
Alveolectomy .....	264
Administration of Nitrous Oxide and Oxygen in Major Surgery,—Technique for ..	267
Bone Grafting of the Fractured Mandible .....	66
Dental Quotations from Cliff Goldsmith's Calendar .....	352
Dentistry in War Time.....	349
Ether Anesthesia, Third Stage. (A Sub-classification regarding the significance of the position and movements of the Eye-ball).....	212
First Molar, The Fate of the..	143
Infections About the Teeth in Relation to Systemic Disease .....	225
Interpretation in Oral Radiography, Some Notes on....	370
Light in the Operating Room	68
Local Anesthesia by Novocain	309
Moderation in the Wholesale Extraction of Teeth, A Plea for .....	346
Nasal Restoration—By an Amateur .....	63
Nitrous-Oxid-Oxygen Anesthesia, Advances in Pure.....	32
Nitrous-Oxid-Oxygen Anesthesia, Relaxants in .....	68
On Being a Good Sport.....	269
Orthodontics, General Considerations on .....	453
Plaster of Paris as an Impression Material .....	198

	Page
Pain in Cutting Hard Dental Tissues .....	69
Septic Bridgework .....	195
Soldiers' Civil Re-Establishment, Dental Services, Department of .....	410
What Are You Getting Out of Life? .....	432
X-Rays in Dentistry, The Uses of .....	174

## EDITORIALS.

Black, Dr. Arthur D., and the Index to Periodical Dental Literature .....	157
Canadian Army Dental Corps.	355
Canadian Dentistry and the Newer Standards .....	317
Canadian Society of Anesthetists and the Dental Profession .....	218
Chicago Meeting, The 1921..	76
Christmas 1921—New Year 1922 .....	464
Dead Teeth and Devitalized Teeth .....	37
Dental Legislation, Need for More Uniform .....	277
Dental Service in the Schools of Toronto .....	119
Dental Welfare Foundation...	392
Intelligence Tests in Selection of College Students .....	466
Legal Responsibility of the Dentist to His Patient, The	430
More Frequent Consultation..	356
National Dental Association Christmas Seals .....	465
Pre-Dental Requirement, The.	196
Preventive Dentistry .....	238
Your Summer Holidays .....	237

## EDITORIAL NOTES.

A Bust of Morton for the Hall of Fame .....	394
Dental Treatment — Ontario Workmen's Compensation Board .....	39
Our New Cover Design.....	40
Sound Bodies in Demand....	39



# INDEX—(Continued)

	Page		Page
COMPENDIUM.		PROVINCIAL EDITORS' CORNER.	
Pages 70, 182, 232, 271, 384, 420		Alberta—John W. Clay, D.D.S.	
MULTUM IN PARVO.		Calgary .....	379
Pages 33, 74, 195, 275, 308, 318, 344, 352, 362, 383, 427, 429, 459.		British Columbia — A. T.	
OBITUARY.		Oberg, D.D.S., Vancouver..	376
Bowman, George Alexander, D.D.S. ....	194	Manitoba—W. W. Wright, D.D.S., Winnipeg .....	383
Greene, Wm. Richard, D.D.S... ..	118	Saskatchewan—C. W. Parker, D.D.S., Regina .....	382
Lewis, Dr. Theo. G. ....	31	MISCELLANEOUS.	
Waldron, Chas. H., L.D.S., D.D.S., M.A. ....	196-276	American College of Dentists, Statement of Objects and Requirements for Fellow- ship .....	409
BOOK REVIEWS.		Dr. Clapp Awards Prizes ....	461
Dental Prosthetics — George Henry Wilson .....	173	Chicago College of Dental Surgeons, "Class A" .....	263
SOCIETY PROCEEDINGS.		Dominion Dental Council, Ex- amination Papers, 1920....	14
Alberta Dental Association Convention ....	231-379	Dominion Dental Council, Suc- cessful Candidates .....	19
Alumni Society of Dewey School of Orthodontia ..	13-115	Dominion Dental Council, Pro- fessional Examinations and Results .....	310
American Institute of Dental Teachers .....	62-457	Forcepitis .....	375
Canadian Dental Associa- tion .....	147-431	Important Decision, An.....	408
Dentistry in Saskatchewan... ..	382	Inquiry into the Causal Rela- tionship Between Initial Dental and Oral Infections and Certain Other Diseases	270
Elgin Dental Society .....	65	Quebec College of Dental Sur- geons, Matriculation Require- ments .....	407
Manitoba News .....	383	R. C. D. S., Meeting of Board of Directors .....	20-221
Manitoba Dental Association. .	88	R. C. D. S., Announcement....	156
Michigan State Dental Exam- ination .....	193-354	R. C. D. S., Conferring Degrees, Graduates 1921 .....	223
National Dental Association, Convention .....	233-342	R. C. D. S., Dental Nurses Graduate .....	223
Ontario Dental Association... ..	80, 158, 231, 278 431	Sucker List, The .....	458
Vancouver Meeting, The.....	376		
Waterloo County Dental Asso- ciation .....	40		

## My New Year's Creed

**T**O work every day as hard as my mind and  
body can stand.

To play, and to be made to laugh that I  
may work the harder.

To sing often, weep when I must, and sym-  
pathize always.

To pursue my own line of conduct, and not  
ape an idea or act.

To gain by the faults of the past, to build  
for the future, but to live ever in the present

To live in self-denial, and yet not drudge.

To keep young to my dying day by loving  
children and doing for folks.

To face duty, not dodge it.

To breast contrary winds, when they come;  
not seek shelter.

To make them serve by the proper setting  
of the sails.

To love my home.

To love all that is good in all faiths, and all  
good people of all faiths.

—Clarence Miller



### YALE-CARIBOO DENTAL SOCIETY

*Top Row, Reading from Left*—F. PARRY, T. B. TURNER, COLIN CAMPBELL, J. E. WRIGHT, J. W. N. SHEPHERD,  
*Second Row*—BROWN, JAYBURN, C. D. SUMNER, J. HENDERSON, E. H. CRAWFORD,  
*Front Row*—IRWIN, DAVIDSON, C. CORRIGAN, R. MATHESON, J. B. GERRY, C. S. DENT, T. HEARD



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, JANUARY, 1921

No. 1

## Neuralgias in Their Relation to Neuroses\*

DOCTOR P. H. BRYCE, CHIEF MEDICAL OFFICER, HEALTH DEPARTMENT, DOMINION GOVERNMENT.

IT is obviously difficult to show the direct connection between neuroses of any kind and their direct effects upon the functioning of any organ or group of organs. It is possible, however, for us to obtain some fairly accurate idea of what is implied in some of the terms now so much in use to explain or attempt to explain what we call nervous phenomena. Ordinarily we make use of such terms as *functional neuroses*, *psycho-neuroses*, *neurasthenia* and *hysteria*. We may, speaking generally, define as functional a disorder which does not imply organic change in tissues and which may be either nervous or bi-chemical in origin. The term neurosis is commonly applied to what would seem to be a hereditary instability in nervous tissues. A psycho-neurosis would, however, be a nervous disturbance based primarily upon conscious or sub-conscious influences, while neurasthenia may be defined as a neurosis dependent upon temporary organic changes due, for instance, to exhaustion induced either by disease as, for instance, an exhausting attack of typhoid, or due to extreme exhaustion such as that during a prolonged vigil in the trenches in war or to a mother's waiting on a sick child, or to a lack of the normal development of suprarenal and other endocrine glands.

Due to some one or more of these causes we may expect to find local disturbances of function such as sleeplessness, mental disturbances of function such as sleeplessness, mental disturbance, nervous dyspepsia, or hyper-sensitiveness of one or more of the nerves and amongst these will come the particular object of our study the trigeminal nerve, which is the great sensory nerve of the face and the

\*Paper delivered before the Ottawa Dental Society, November 15th, 1920.

head. But since the vegetative system underlies all others, I fancy that the most obvious disturbance of the nervous system which appears will be in what we may call disturbances of the stomach. We all recognize at once the type of nervous anaemic child which is fastidious in its tastes, irregular in its appetite and liable to what we term disorders of digestion. As we know to-day this condition is often due to hereditary causes and is especially seen in the child of a family where either parent inherits, to say the least, an unstable nervous system or to a tuberculous diathesis, or it may be directly due to the presence in the child of a tuberculous infection which has occurred in infancy, either bovine in character or due to infection from some human source. Such children are further found in many instances to be lacking in what we call firmness of tissue and due to the lack of lime salts, resulting often in an early decay of the teeth and general malnutrition.

As is obvious a poor digestion, which depends directly upon an inadequate secretion from normal digestive glands will be the phenomenon first to show itself. We speak to-day of hyper-acidity of the stomach. In some cases it is directly dependent upon the hereditary type of tissue and recently the terms *sympathetico-tonic* and *vago-tonic* have been used to distinguish persons in whom the sympathetic nervous system is on the one hand hyper-aesthetic or unduly sensitive to external impressions or have an indigestion dependent upon the extreme emotional character of the individual. On the other hand in the vago-tonic type, called sometimes the para-sympathetic, we see a storage of the reserves and with this is associated an over-activity of the lymphoid structures of the body. The latter type is interesting from our standpoint in that it presents often distinct physical signs, such as a tendency to skin eruptions as urticaria and over-development of the lymphatic system and a tendency to anaphylactic shock. Such persons seem liable to asthmatic seizures, laryngeal spasms and croup, low blood pressure, hyperchlorhydria and spastic constipation, all directly associated with an over-sensitive vagus or pneumogastric. I have often thought this term fulfills best what we are accustomed to call the rheumatic or gouty diathesis.

Now some of the obvious effects of a hereditary neurosis would be not only the disturbance of gastric and intestinal secretions, but also disorders of digestion promptly showing themselves in the production of toxins in the bowel absorbed into the blood, resulting at times in constipation and intestinal stasis and at others in nervous diarrhoea and fermentation, and in both of which toxins are formed and are absorbed into the blood and affect directly the nervous system and the functioning of organs.

Before taking up our special subject, that of neuralgias affecting

especially the face and teeth, it is well to review for the moment the blood and nerve distribution of the teeth. I need not refer to the matter of the development of the teeth, which all persons here know so much better than I; but it is well to recall that in the development of the teeth we have the interesting fact of the epithelium on the surface dipping down and meeting the papilla whose growth goes on like other tissues, but is being slowly enveloped by the bony casing of the jaw, while its dentine is built up from the connective tissue cells supplied with blood capillaries and nerve filaments, which as the tooth is completed fill up the pulp cavity which they enter through a very narrow opening at the base of the root. It is to these nerve filaments then and blood supply that our special interest attaches. The blood vessels, which supply them, are regulated by the vaso motor nerves which supply the muscular tissue of the smaller vessels and arterioles. We have these both as constrictor nerves and dilator nerves. The regulating centre of the vaso-motor system primarily is in the gray matter of the floor of the fourth ventricle of the brain, and it is the effect of this centre of specialized nerve cells, which sends fibres to subsidiary vaso-motor centres through the spinal cord to the ganglia of the sympathetic system lying in front of the spinal column. The stimulus maintained by the vaso-motor nerves maintains a gentle blood pressure in all the arterioles and capillaries of the body to ensure adequate nutrition to every part. If this centre is destroyed then the blood pressure everywhere falls and venous congestion takes place. Or if some sudden stimulus or shock occurs the vaso-constrictors activate in the same way and the blood for the moment is prevented from entering the capillaries. This result is readily brought about by some sudden shock to the emotions through the eye, ear or other special sense, or it may be due to subconscious influences rising into consciousness, and similarly affecting the vaso-motor centres. So important does this emotional shock appear to be that we have in it a seeming explanation of the whole series of mental phenomena based upon nerve reflexes, which may reach the extent of what was known as shell-shock in the army, and has been for many years recognized as a type of neurosis known as hysterio-epilepsy. Obviously the underlying fact in these various mental states, which may be called functional, is that of an unstable, irritable and imperfectly nourished nervous system. It is reasonable to suppose and is undoubtedly a fact that cells of the gray matter of the cerebrum and nuclei of the nerve centres inherit their special qualities for good or ill just as do the primary cells of any other organ of the body. While I am certain that a great deal too much has been attributed to the permanent influences of germ plasm in evolution, some indeed going so far as to make it a principle as important as gravitation, yet it cannot be doubted that the successive



generations of nerve cells in the formation of the tissues of the body must necessarily transmit the qualities or attributes of their cell ancestors. On the other hand we have to realize that from the moment of birth an external environment operates along with the internal environment to create through nutrition not only the body tissues of the different organs through the primary senses, such as the desire for food or the quest for food, but that within a few weeks of birth is the beginning of consciousness, and the experiences of the child derived from external impressions are so frequently repeated that we may fairly assume that they will in a large degree tend to over-ride hereditary abnormalities and, if subject to proper control, so build up both the cell qualities of the cerebrum and sympathetic nervous system that such will function normally under the ordinary conditions of life.

We have just referred to the primary sense in the new born being a desire for food and may now turn to the problem of nutrition as being one which is directly under our control. Probably in nothing are the results of mal-nutrition more evident than in those diseases, which the dental surgeon has to deal with, but it is mostly the end results that come under his care. To-day we know much about the results of what are called "Deficiency Diseases," though twenty-five years ago I think there was not a text book in English which referred even to infantile scurvy. I recall a patient of mine, diagnosed I believe as the first of its kind in Ontario, which showed the spongy gums and periosteal inflammation of the tibiae and the other acute signs of this disease. After the failure of several child specialists to diagnose the trouble and I was left helpless, I found luckily an article in the weekly number of the "London Lancet" entitled "Thirteen Years' Experience of Infantile Scurvy or Acute Rickets," by Sir Thomas Barlow. The article gave a complete picture of the disease and indicated the cause and supplied the remedy. Within five days of administration of sterilized grape juice the acute symptoms were relieved and recovery was rapid.

In this first case then of "Deficiency Disease" we find that there was a lack of vitamins of the "C" Group or that which relieves scurvy by fruit juices. There is little doubt, however, but that it is the vitamins of the "A" Group or those which are fat-soluble, which are of the greatest importance in general nutrition. Prof. Mendel finds them especially in cod liver oil, which I have for years, indeed, looked upon as the most valuable means of reconstruction in defective nutrition. Other vitamins soluble in water belong to the "B" Group and are found in grains, in fruit, and in the yolk of egg, and such are liable to be dissolved out in cooking since they are especially concentrated in the germ of the seed, and are further liable for this reason to be removed during the milling process. They withstand

boiling for a short time, but are destroyed after 130 C., and are commonly called anti-neuritic and are known to be absent in food where beri-beri is present.

Such is the picture given us of the splendid work by Mendel, Osborne and McCollum in America, by Hopkins and Drummond in England, and by McCarrison in India, and with all there is a general agreement that there is a something present in vitamins such as an enzyme which provides the condition for the metabolizing of food in the tissues. At the same time experiments in feeding have shown that in the amino-acids present in various substances the tissue compounds of the body can be synthesized from the proteins and that of other basic food stuffs. Thus the monkeys fed with protein, fats, carbohydrates and salts develop normally if the special vitamin is supplied. Thus we are led to suppose that nucleic acids, phosphatides, creatin and leucin, etc., are built up from basic foodstuffs.

I have attempted briefly to present the bare facts of this most intricate but all important matter, and may now turn to some of the obvious earlier facts of "Deficiency Disease." The study of the effects of experiments in feeding of monkeys, etc., is most interesting. Thus rats fed on food lacking the vitamins in Group "A" developed ophthalmia and microbes grew freely on the mucous membranes of the eye. McCarrison refers to a family of improperly fed children who suffered from mucuous disease in India especially marked with *acidosis*. The disease was directly due to a lack of proteins and vitamins with an excess of carbohydrates. The resulting clinical effects in such cases are dislike for food, loss of weight, asthenia and anaemia, with eczema, vomiting, diarrhoea and muscular weakness ending in paralysis. The pathological changes are seen in atrophic changes in the sub-maxillary glands, the pancreas and coats of the stomach and bowels, with congestion and digestive mucuous changes throughout the stomach and intestines, which in their weak state are readily invaded by bacteria. When these conditions are present even strepto-cocci produce ulceration of the stomach. In such cases giving food with vitamins resulted in a rapid improvement and a case is given where a man had for years been an invalid and had resorted to lavage of the stomach, who was cured in a short time of his anaemia and neuralgic pains by a full diet containing vitamins.

To complete our resume, however, of conditions favoring neuroses we may turn to the toxamias induced under such conditions as pregnancy. In Dr. A. W. Bourne's lectures he points out that throughout *the term* there seems present in the blood of the mother a persistent toxine, due to the growth of the ovum, which is absorbed through the placenta, and which seems to develop in the blood an anti-toxine tending to antidote free proteins which seem to be present in the blood. A curious fact is found in many of these cases, where

there is often a lack of formation or at least of the excretion of urea, namely an increase of *acetone* ( $C_3H_3O$ ) which is especially produced from fat when carbohydrates are lacking in the blood. Its presence in excess is productive often of a destructive neurosis, since it tends to produce congestion of the terminal capillaries of such organs as the adrenals and membranes of the brain. These conditions seem intimately related to the frequent mental disturbances during the period with associated neuroses, such as trigeminal neuralgia. This reference brings us directly to the consideration of a series of neuroses having a distinctly psychical element, growing out of impressions, often sub-conscious in character and which even apart from consciousness produce potent effects upon mental activities. Through the vital activity of the nervous system from the lowest reflexes to the highest neuro-psychic activities the functions of the automatic nervous system are controlled by those higher in the scale and these again until the gray matter of the cortex is reached. For instance, the activity of the optic thalamus is normally under the control of the cerebral cortex. The thalamus is the centre of the more emotional parts of sensation peculiarly associated with effectiveness, as of pleasure, pain and other emotions, so that whenever this centre is relieved from control of the grey matter of the cortex, or of consciousness and will, the patient is very sensitive on the emotional side to either class of sensations, whether of pleasure or pain. These are directly associated with the vaso-motor system, which is in intimate relation to the ductless glands and conditions in them the sudden discharge into the blood of it may be adrenalin, thyroïdin, pituitrin, or other special glands and which have given rise to the idea that special substances, volatile odours, spoken of by the old German teachers and termed *gemeingefühl* were associated with the idea of pleasure and pain. Should there be cerebral disease or the temporary loss of function in the cortex the responses of the uncontrolled sensations which affect the thalamus might be productive of most serious results; but in mental growth the cerebral control of such centres gradually increases and thus the simple reflexes instead of being a menace are steadily inhibited through the conscious processes in the cortex of the brain. The time may come, however, when this mental control ceases to be automatic or normal and the individual becomes conscious of the need of some means for resisting such imperative claims as that of fear as for instance going into battle, or some sense desire. Such a situation necessarily develops a mental conflict and in order that a person's actions shall remain normal such sensations must be sternly pressed into the background. Now it is at this point that the persistent coming into consciousness of such ideas may result in physical and mental troubles of a certain sort due to the attempted repression. This repression is not absolute, perhaps, and is but half



hearted, and so we have constantly cropping up into consciousness the ghost of something desired, something lost, something left undone, or done wrongly, which ends in the disturbance of normal mental processes. The inevitable result, if such be long continued, is the effect not only upon mental but also the vegetative processes, and so we have appearing dyspepsia, headache, insomnia, and mental aberrations.

Fortunately for us Nature seems to provide that the persisting stimulus gradually loses its more acute effects and as it were through habit the sense of shock is lessened; we are not overpowered either with joy or sorrow or in other words the mind learns to adapt itself to the mental environment. Should the outcome, however, of this emotional strife have been a failure of health and vital energy, then the person will have become a victim of what we call irritable weakness with fatigue, loss of sleep and neurasthenia until we have what we call an exhaustion psychosis. It is at this point we find appearing mental aberrations often of the most peculiar character as frequently appeared in soldiers during the war when some fancy seized the tired brain and resulted in perhaps a loss of memory, a confusion of personality or some behaviour such as that recently illustrated in the case of Dougan, who seems to have lost himself for ten days, which often seems to be a repression or activation in the direction of some more primitive or youthful kind of action. Whenever the perfect mental and physical control, under which action becomes automatic, such as in games, or the control of the motor or airplanes, becomes disturbed an uncertainty develops as to sureness of the results of automatic action, results in disturbances of the sensory-motor equilibrium, and to the individual it may become a source of worry and results in dreams and nightmares in which old events of a disturbing kind seem often to predominate. In such cases adaptation is what we must depend upon in the nervous system to have it respond to a stimulus of continuous and constant intensity in order that its reactions may steadily decrease. Thus our ability to shut out disagreeable street noises or other external impressions becomes a measure of our ability to function normally with regard to the external world around us, and is equally true with regard to our ability to push into the background unpleasant mental experiences. Whether the disturbance be functional, psychic, neurasthenic or hysterical, the only diagnosis of the situation of practical value is in the ability to lay bare the forces which underlie the morbid state and to find the mental experiences which have originally set them in motion. The form of the psychosis depends upon the particular person, his special habits and constitution. The success in dealing with his problem will prove, in the intricacies of civil life, often more difficult than the simpler environment of warfare. Our successes will depend on

our ability to discover the processes producing the neuroses, and if we succeed, the causal factors underlying his phenomena can mostly be readily worked out. Often, however, the patient is conscious of the experiences lying at the bottom of his own trouble, but refuses to face them by bringing them into consciousness, and different experts are still disputing whether such disturbances are the more readily dealt with by bringing them thus into full view in the mind of the patient or to push them into the realm of forgetfulness by covering them up with a new set of healthy ideas. It would seem, however, generally agreed that the problem is best met by making a patient realize his own state as being one which need not be looked upon as peculiar and may be easily remedied and, as in making the person who has hysterical aphonia find out that he can speak, the evidence of the fact becomes the primary and sufficient means of cure. In such difficult cases the wisdom and sympathy of the true physician may be enough to remove the mental inhibition or mental change while a new environment may be advised; or finally hypnosis may be the occasion under which new and healthy impressions are made to displace the mental obsession. One of the physical effects of such psychoneuroses may show itself in acidosis or excess of acetone ( $C_3H_3O$ ) in the urine, and is often present in epilepsy and melancholy. Post-mortem appearance shows an intense minute injection of the pialarachnoid membrane of the brain and degeneration in nerve cells. The acetone produces hemolysis of red corpuscles. Acidosis is supposed to favor bacterial infection as T.B. The adrenals help in protection against these autolytic tendencies. Potassium citrate restores fat metabolism to normal. Glucose or sodium bicarbonate are given in attacks.

I have dwelt, perhaps at some length, on general neuroses and their causes, and may now turn to that which is our special object, viz., neuralgias of the trigeminal nerve. It starts from the side of the pons, and has a small motor but a large sensory division. The former supplies the muscles of mastication, the tensors of the palate and tympanum, the myo hyoid and the anterior belly of the digastric nerve. Its sensory division runs to the Gasserian ganglion, and passes out as the great sensory nerve of the face and head. The motor fibres arise from the nuclei in the upper part of the floor of the fourth ventricle, but some fibres are from the pons and mid brain. This is the superior nucleus. The sensory fibres arise from the cells of the Gasserian ganglion. One branch of each passes to the periphery in the skin of the head and face, and the other grows central-wards. On reaching the pons its branches bifurcate authorizing around the principal sensory nucleus of the 5th, which has lateral branches to the motor nucleus, while the descending branches go down to the bulb, where they form the

descending root of the 5th, and some reach down to the spinal cord as far as the 2nd cervical nerve. Such are the origin and distribution of this great nerve, which is liable to become the source of such trouble, which may have its origin either in the central brain area, in the ganglion, or in some one or more peripheral branches. In the facial area pain is referred commonly to the 2nd division supplying the upper jaw and cheek, upper lip and side of nose, or to the 3rd division in the lower jaw, lower lip and side of tongue. Often both are affected at the same time, and pain will cease only partially, if only one division is treated. Sometimes the 1st division or supra orbital is attacked, but not often alone.

Now perhaps, as is to be expected, any interruption of the conduction of afferent sensations along these branches of the 5th nerve will give instant relief from pain, and proves that the neuralgia is dependent upon stimuli-affecting peripheral nerve endings. So permanent destruction of the Gasserian ganglion means permanent anaesthesia of the whole area supplied by its branches. The peripheral neuralgia is doubtless in a large measure due to septic-poisoning of the dental nerve filaments from caries and pyorrhea in which streptococci and other germs may be found. Dr. William Harris, of St. Mary's Hospital, London, points out that many neuralgias have begun immediately after dental operations or abscesses of the antrum. No other nerve of the body is so liable to chronic infection, and often after years the infection which was thus introduced and had become dormant returns when it has passed into the nerve filaments within the jaw. The neuralgia may become worse after the removal of a tooth than before. The cases in men are two to one in women, and those of the right face as two to one of the left. Amongst other special causes are a chill in the face, and intense emotions; or again, the cause is due to a blow on the face. Sometimes it is intense and paroxysmal, as that described by Dr. John Locke, in 1677, in the case of Lady Northumberland. "When the fit came there was, as it were, a flash of fire all of a sudden shot into those parts and at every one of those twitches, which made her shriek, her mouth was constantly drawn to the right side toward the right ear by repeated convulsive movements, which were constantly accompanied by her cries. These violent fits terminated all of a sudden, except a dull pain ordinarily remained in her teeth and an uneasiness of that side of her tongue which she thought to be swollen, but which was not in any way altered, though it seemed to have a scalding pain in all that half of her tongue. She had usually a premonition of the fit by throbbing in the upper jaw over against it." Dr. Harris tells of a case where, six years before he saw her, she had become suddenly affected in the night. After six years she got permanent relief by the injection of both 2nd and 3rd divisions with



alcohol, and finally the injection of the Gasserian ganglion made the cure complete. The onset is rare under 20 years; a few occur under 30 years. Almost never have the attacks disappeared spontaneously. Curiously considerable intervals may elapse between attacks, as in one case they returned after a period of three years. As may be supposed with the several influences which may end in an attack of tic dolooureux, it is difficult to ascribe to heredity any special influence, yet in over 500 cases Dr. Harris specifically ascribed five cases to heredity. One case is where a father suffered for 25 years till seventy and then outlived the attacks, while his daughter suffered for 20 years until the inferior dental nerve was divided. One of her daughters again began to suffer at 36 with spasmodic neuralgia of the 3rd division. After treatment with drugs failed, Dr. Harris injected the nerve at the *foramen ovale*, causing complete anesthesia and a complete cure of the pain. In other cases he records it was the mother of the patient who had suffered. One patient suffered two days and then had two teeth out, but was no better; but subsequently the attacks seemed localized in the right side of her tongue. The pain in such cases has often been so great that until the methods of alcohol injection and removal of the Gasserian ganglion have been practised suicide was often the end of this dreadful disease. The attacks, if continued, result through shock in rapid loss of strength, owing to inability to take food properly, and spasms are started by attempts at eating and talking. Of the drugs used, gelsemium seems to be of greatest use where large doses of morphine have failed. It is probably true that, as in other neuralgias, the salicylates with organic bases will prove the most valuable, since they actually serve to increase the elimination of uric acid. In most cases a cold wind or draught are the occasions which start a neuralgia which is dormant, but, illustrative of its neurotic character, these patients curiously have no special immunity in hot weather. One patient of Dr. Harris had a premonition, like Lady Northumberland, like a burning sensation on the top of the head for some days before the neuralgic attacks commenced, while another always got a shivering sensation along the right cheek before the pain started. She had lost all her teeth twenty-seven years before the pain began. The pain at onset comes like an electric shock. One patient thought she had bitten on a needle and broken a tooth; some say it is like hot daggers or a hot knife being run into one; while in others it starts as a tapping sensation till the electric-like explosion takes place. In the high pressure of life to-day, where a great drain is being put upon the nervous system, where high living is too often associated with rapid living, we have created conditions in which the nucleo-proteins of food are not only taken in excess, but the formation of uric acid and its side products is in excess, while

their elimination through congested kidneys is often inadequate. The gouty diathesis is in evidence, and a true anaphylaxis, due to proteins of the purin type, becomes established. These conditions are associated with cases where epilepsy may result, and while no albumen may be present in the urine or diacetic, acid is produced in excess. The effects of persistent emotional shock are to interfere with the metabolism of the tissues, and so acidosis may result. Dr. H. B. Shaw, of the Staffordshire Mental Hospital, points out that in fright and anxiety the mental stimuli pass to the splanchnic nerves and liver, and result in acetone formation. Continued influences of this kind tend to exhaust the suprarenal glands, which are a protection against cell degeneration. An important fact is that stated by Dr Shaw regarding the production of acetone from glucose by streptococci responsible for pyorrhea alveolaris. The lessened use of fats and the increased use of carbohydrates, with the administration of potassium citrate and other basis salts, seem the direct means of lessening acidosis.

Such, then, is the *resume* of the many factors which underlie neuralgic attacks which have their climax in tic douloureux. What I have endeavored to make plain is that, like epilepsy, this disease seems to have almost a special pathology; but in every case it is a neurosis closely allied to those cerebral conditions intimately dependent upon disordered blood metabolism or the abnormal presence of some toxin, as uric acid or acetone, due either to their excessive production in the tissues or to their defective elimination. Their permanent cure demands all the resources of the specialist and the hygienist. Perhaps the most we can say, however, is that a well-ordered life from infancy, in which diet, exercise and rest are normal, with educated control of the emotions, and the pursuit of life with no undue draught upon vital energies, and the higher emotional nature, are here, as well as in all other conditions, the surest guarantee of a *sana mens in corpore sano*, and the maintenance of what Sir W. Osler happily describes as "equanimitas," after the precepts of Epictetus, the philosopher.

---

## Alumni Society of Dewey School of Orthodontia

---

THE next annual meeting of this society will be held on April 25th and 26th at the Hotel Ambassador in Atlantic City. The usual high standard of the meetings of this society will be maintained. Clinics and evening sessions will be included in the programme. All interested in Orthodontia are cordially invited to attend these meetings.

George F. Burke, Secy.,  
741-43 David Whitney Bldg., Detroit, Mich.

## The Dominion Dental Council, 1920

THE Dominion Dental Council Examinations, held at selected points throughout Canada during the month of October, are now reported upon by the Secretary-Treasurer, Major W. D. Cowan, Regina. The examination papers, as well as the names of the successful candidates, are published because of the keen interest of the entire profession in the Dominion Dental Council. This certificate has now come to be established as the recognized Canadian national Dental standard:

### EXAMINATION PAPERS, OCTOBER, 1920.

#### ORTHODONTIA.

Examiner: Ross Thomas, D.D.S., D.D.C.

Value Question.

- |    |  |
|----|--|
| 10 | 1—Give the classification of the irregularities of the human teeth. Quote the authority given.             |
| 10 | 2—Define Occlusion, Articulation, Mastication, Absorption, Frenium Labium.                                 |
| 10 | 3—Traumatic Occlusion. What is it?   |
| 10 | 4—Describe the peridental membrane. Illustrate.  |
| 10 | 5—Define anchorage. Illustrate.  |
| 10 | 6—What forces govern normal occlusion?   |
| 10 | 7—Define retention. What forces determine how long retainers are worn?                                     |
| 10 | 8—What stress do you put on the use of X Rays in Orthodontia?  |
| 10 | 9—Why do you recommend the removal of adenoids and enlarged tonsils before starting a case of Orthodontia? |
| 10 | 10—What is the future of Orthodontia in Dentistry?   |

#### PATHOLOGY AND BACTERIOLOGY.

Examiner: D. N. Ross, M.D., L.D.S.

Value Question.

- |    |   |
|----|---|
| 12 | 1—Give a full description of the calcifications found in the pulp chamber and state their effects upon pulp tissue. |
| 12 | 2—Classify chronic alveolar abscess and describe the several forms.   |
| 10 | 3—Describe the process of healing in a simple fracture.   |
| 10 | 4—What do you know of the causation and pathology of necrosis?  |
| 10 | 5—Discuss the clinical and histological differences between simple and malignant tumors.                            |
| 12 | 6—Classify bacteria and give examples of each. How do they multiply?  |
| 10 | 7—Define:—opsonin, agglutinin, complement, pyaemia, and septicaemia.  |
| 12 | 8—Tell how you would proceed to get a pure culture of one bacteria where other bacteria are present.                |
| 12 | 9—Define and discuss fully immunity.  |



ANAESTHETICS.

Examiner: N. B. Steed, D.D.S.

- | Value | Question.   |
|-------|---|
| 8     | 1—(a) Define nerve blocking, infiltration, anaesthesia.<br>(b) Enumerate and briefly describe other methods of producing local anaesthesia. |
| 7     | 2—(a) What is an isotonic solution?<br>(b) Describe the effect on the tissue cells of hypo-tonic and hyper-tonic solutions, respectively.   |
| 15    | 3—Describe minutely the technique of the injection necessary to block the inferior dental and lingual nerves.                               |
| 15    | 4—What injection, or injections, would be necessary to enable you to painlessly remove all the teeth from a Superior Maxilla?               |
| 10    | 5—Enumerate the restorative agents which should always be on hand when making use of local anaesthesia.                                     |
| 15    | 6—Into how many stages, or degrees, may Ether narcosis be divided? Describe them.   |
| 15    | 7—Describe the effects of Chloroform on:<br>(a) Circulation.<br>(b) Respiration.  |
| 15    | 8—What are the indications and contra-indications that would guide you in choosing between chloroform and ether as a general anaesthetic?   |

OPERATIVE DENTISTRY.

Examiner: W. A. Black, M.A., D.D.S.

- | Value | Question.  |
|-------|--|
| 10    | 1—Describe the preparation of a small cavity in the mesial of a superior right central for a synthetic filling, also technique for insertion of and finishing of the filling.          |
| 10    | 2—Describe the preparation of a M. O. D. cavity in a lower first molar for a gold inlay, including the wax impression and the insertion of the inlay.                                  |
| 10    | 3—Describe the preparation of a disto-occlusal cavity in the lower second bicuspid, describing the mixing of the amalgam, the insertion of the filling, and the finishing of the same. |
| 10    | 4—Write a note on the etiology of perioclasia and describe some of its systemic effects.   |
| 10    | 5—How would you differentiate between active hyperemia and passive hyperemia of the pulp—what is the physiological difference?   |
| 10    | 6—What are pulp nodules, and what is the cause of their formation?   |
|       | 7—Describe a prophylactic Treatment.   |
| 10    | 8—Name systemic diseases which may occur as a result of focal infection.   |
| 10    | 9—Define: "traumatic occlusion," "erosion," "abrasion," "periodontal abscess," and "dead tooth."   |
| 10    | 10—Give methods of devitalization of the pulp. State advantages and disadvantages of each.   |

PHYSIOLOGY.

Examiner: A. W. Cogswell, M.D., C.M., D.D.S.

- | Value | Question.  |
|-------|--|
| 10    | 1—Define: inhibition, diffusion, osmosis.  |
| 10    | 2—Name the agents which are active in the digestion of starch proteids and fats. Describe their action and indicate their normal position in the alimentary tract. |

# ORAL HEALTH

- 10 3—Describe the mechanical phenomena of respiration.  
 10 4—Describe the heart beat.  
 10 5—Name the sources of body heat.
- HISTOLOGY.**
- 10 6—Describe the structure and development of a tooth.  
 10 7—Describe the process of cell division.  
 10 8—Name and describe the lingual papillae.  
 10 9—What are the modes of termination of sensory nerve fibres?  
 10 10—Name the layers of the blastodermic membrane and give  
 an example of a tissue or organ histogenetically related  
 to each.

## ANATOMY.

Examiner: C. H. Weicker, D.D.S.

- | Value | Question.   |
|-------|---|
| 10    | 1—What muscles move the lower jaw?  |
| 20    | 2—Describe the Superior Maxillary bone and give its articulations.                  |
| 10    | 3—What bones articulate with the Temporal bone?                                     |
| 15    | 4—Describe briefly the Internal Maxillary artery and its branches.                  |
| 10    | 5—Describe fully the Temporal fossa.  |
| 15    | 6—Describe briefly the Mandibular or Third Division of the Fifth nerve.             |
| 10    | 7—Describe the Sphenoidal fissure and tell what vessels and nerves pass through it. |
| 10    | 8—Describe the Vidian nerve.  |

## MEDICINE AND SURGERY.

Examiner: Dr. C. N. Abbott.

### MEDICINE.

- | Value | Question.   |
|-------|---|
| 10    | 1—Describe the cervical form of Tuberculo Adenitis.   |
| 10    | 2—Discuss the Etiology of Anthritis Deformas as of nervous origin or chronic infection.     |
| 10    | 3—What are the physical signs and symptoms found in dilatation of the heart?                |
| 10    | 4—Discuss the influence of some chronic systemic diseases on the oral cavity.               |
| 10    | 5—Describe the distinguishing characteristics between follicular tonsilitis and diphtheria. |

### SURGERY.

- |    |  |
|----|--|
| 10 | 6—What are the indications and contra indications for the use of Salvarsan in the treatment of syphilis? |
| 10 | 7—Describe the Etiology and the more common complications found in Erysipelas.                           |
| 10 | 8—Name five conditions which are the usual types seen in early carcinoma of the tongue.                  |
| 10 | 9—What are antitoxins? Describe their therapeutic uses.  |
| 10 | 10—Describe some of the most satisfactory and recent methods of treating compound fractures of the jaws. |

## CHEMISTRY AND PHYSICS.

Examiner: Harry S. Thomson, D.M.D.

- | Value | Question.   |
|-------|---|
| 10    | 1—Define: Chemistry, Analysis, Synthesis, Combustion, Osmose, Diffusion, Element.<br>(b) Define and name two: Oxide, Reducing Agent, Electro-Positive Element, Radical, Base, Acid, Normal Salt, Anhydride. |

- 10        2—Write the reactions for the following:  
            The making of Iron Sulphide.  
            The making of Hydrochloric Acid.  
            The making of Magnesium Oxide.  
            The making of Silver Nitrate.  
            The making of Sodium Carbonate from Common Salt.  
            The making of Oxygen. Draw the apparatus.
- 10        3—Describe and explain what happens chemically when a  
            piece of Sodium is placed on water. Equate.  
            (b) What happens if Nitric Acid is added to the liquid  
            left from the experiment mentioned above until the reaction  
            is neutral?  
            (c) How could a solid now be obtained from the liquid?  
            (d) What will happen if Sulphuric Acid is mixed with  
            the solid and heat applied? Give equations.
- 10        4—Describe Mercury. State some of its general uses.  
            (b) How may it act as an irritant poison?  
            (c) What precautions should be observed for safety?
- 15        5—Name the elements of the Chlorine Group. Give the sym-  
            bol and the method of preparation of Iodine. State its  
            use in dentistry.
- 15        6—Give the physical properties of Silver, and state its most  
            important Salt.  
            (b) Describe a method of obtaining Silver from one of  
            its native ores.  
            (c) Explain the chemical process for recovering pure Sil-  
            ver from refuse Amalgam.
- 15        7—Define Organic Chemistry.  
            (b) Discuss the Saliva, giving its physical properties and  
            constituents.  
            (c) Give the Sulphocyanate test.  
            (d) Name the chemical constituents of Dentine and  
            Enamel.
- 15        8—You are given a specimen of urine containing an abundant  
            sediment consisting chiefly of normal blood corpuscles;  
            how must such a sediment be treated in order that the  
            detection of other elements, if present, may be assured?

## JURISPRUDENCE AND ETHICS.

Examiner: H. G. Dunbar, D.D.S.

Value Question.

- 15        1—Define: Writ, Subpoena; Revocation; Jurisprudence; Con-  
            tributory Negligence; Malpractice; Delegation of Contract;  
            Jurisdiction; Minor; Latent Injury.
- 15        2—Define Liability and discuss fully:  
            (a) Liability of dentist for communication of disease  
            to patient.  
            (b) Liability of dentist in the improper use of anaesthetics.  
            (c) Liability of dentist for malpractice of an assistant or  
            substitute.
- 15        3—(a) What do you consider the most ethical method of  
            estimating fee for services rendered?  
            (b) In the order of their importance give the objects of  
            legislation to regulate the practice of dentistry.
- 15        4—Discuss the application of the principles of Ethics to:  
            (a) The relationship between the dentist and his fellow  
            practitioner.  
            (b) The relationship between the dentist and his patients.
- 10        5—Define necessities and discuss the question of legal lia-  
            bility of a parent for dental services to his children.



- 10 6—Outline your method of handling the undesirable element of an ordinary practice.
- 10 7—By what ethical means may the dentist endeavor to extend his practice?
- 10 8—Define your limitations in the writing of prescriptions or in the performance of minor surgical work in the oral cavity or associated parts.

### PROSTHETIC DENTISTRY, CROWN AND BRIDGE WORK, METALLURGY.

Examiner: John W. Clay, D.D.S.

#### PROSTHETIC DENTISTRY.

Value Question.

- 18 1—Give the Technic in detail of the replacement of the four upper bicuspid teeth.
- 12 2—Give your method for taking a full lower impression.

#### CROWN AND BRIDGE WORK.

- 12 3—With the tooth preparation completed, describe the making of a porcelain jacket crown.
- 12 4—Describe the making of a gold crown with cast occlusal surface.
- 15 5—How would you replace a lost upper first bicuspid tooth? Give Technic.
- 9 6—Tell what you know about investment materials.

#### METALLURGY.

- 12 7—Give the physical properties, and the uses, of Zinc and Lead, in Dentistry.
- 12 8—Describe the manufacture of a solder for 18K gold. Give formula of solder for 22K and 20K gold.

### MATERIA MEDICA AND THERAPEUTICS.

Examiner: William P. Broderick, D.D.S.

Value Question.

- 10 1—Give derivation, dose for adult, and uses of the following drugs: Potassium Bromide, Nux Vomica, Phenacetin, Digitalis Sodium Bromide, Citrate of Magnesia, Aconite.
- 10 2—Write two prescriptions of three components each (a) for a local anaesthetic, (b) for an astringent mouth wash.
- 10 3—Name and give internal medicinal dose of one drug for each of the following: Antiseptic, Cathartic, Sedative, Heart Stimulant, Haemostatic.
- 10 4—Define: Therapeutics, Incompatibility, Anaesthesia, Astringent, Asepsis, Alkaloid, Tincture, Prophylaxis.
- 10 5—Give derivation of dental uses of the following drugs: Cocaine, Tincture Iodine, Nitrite of Amyl, Bichloride of Mercury, Oxide of Zinc.
- 10 6—Define erosion of the teeth. Give causes and your method of treatment.
- 10 7—What causes hypertrophy of the gums? Give treatment with formula for mouth wash for same.
- 10 8—Give Etiology and method of treatment of Pyorrhea Alveolaris.
- 10 9—Describe your method of pulp extirpation (a) with cocaine, (b) with arsenious acid.
- 10 10—What are the chief causes of death of the pulp, and give your treatment for abscessed tooth.

## Successful D. D. C. Candidates.

### OPERATIVE DENTISTRY (PAPER)

Bishop, R. B. Farrer, I. K. McDonald, D. D.

### OPERATIVE DENTISTRY (PRACTICAL)

Farrer, I. K. McDonald, D. D.

### PROSTHETIC DENTISTRY (PAPER)

Bishop, R. B. Dinniwell, R. E. Farrer, I. K.  
McDonald, D. D.

### PROSTHETIC DENTISTRY (PRACTICAL)

Farrer, I. K. McDonald, D. D.

### ORTHODONTIA

Bishop, R. B. Farrer, I. K. McDonald, D. D.

### JURISPRUDENCE AND ETHICS

Coysh, B. R.

### MEDICINE AND SURGERY

Benezra, I. M. Lough, H. G. McDonald, D. D.

### PATHOLOGY AND BACTERIOLOGY

Coysh, B. R. Crowe, V. D. Derbyshire, A.  
Dinniwell, R. E. Farrer, I. K. Finnigan, M. D.  
McDonald, D. D. McIntosh, G. P. Lent, F. E.  
Wilson, P. R.

### MATERIA MEDICA AND THERAPEUTICS

Cameron, A. A. Derbyshire, A. Daly, A. P.  
Dinniwell, R. E. Farrer, I. K. Finnegan, M. E.  
Johnston, R. E. Lent, F. E. Layton N. McGregor  
McIntosh, G. P. McDonald, D. D. Porter, A. B.  
Steele, C. W. Wilson, P. R. Whyte, J. P.

### ANATOMY

Beach, F. W. Derbyshire, A. Daly, A. P.  
Fluck, W. L. Gabriel, J. M. Jackson, Wm. R.  
Johnston, R. E. Keith, W. F. Langmaid, W. J.  
Layton N. McGregor McGrath, J. N. Olson, J.  
Porter, A. B. Ritchie, J. S. Rupert, A. E.  
Snell, A. R. J. Teal, G. E. Wilson, M. R.  
Whyte, J. P. Young, W. H.

### PHYSIOLOGY AND HISTOLOGY

Charles, B. F. Derbyshire, A. Dixon, H. W.  
Daly, A. P. Evans, Jas. D. Fahey, H. J.  
Fluck, W. L. Hodgkins, R. R. Jackson, Wm. R.  
Knight, H. N. Layton N. McGregor Ritchie, J. S.  
Rupert, E. A. Snell, A. R. J. Wilson, M. R.  
Whyte, J. P. Young, W. H.

### PHYSICS AND CHEMISTRY

Cummer, H. H. Dixon, H. W. Fluck, W. L.  
Groneau, Z. I. Graham, C. C. Hodgkins, R. R.  
Jackson, Wm. R. Kerr, W. J. Lequeyer, L. J.  
McMillan, E. A. Olson, J. Prestein, G. L.  
Porter, A. B. Rupert, E. A. Snell, A. R. J.  
Wessels, W. E. Young, W. H.

### ANAESTHETICS

Benezra, I. M. Bishop, R. R. Coysh, B. R.  
McDonald, D. D. Farrer, I. K.

## Meeting of Board of Directors, Royal College Of Dental Surgeons of Ontario

THE Board of Directors of the Royal College of Dental Surgeons met in the College Building, Toronto, on Tuesday, Wednesday and Thursday, December 14th, 15th and 16th, 1920. This was the last meeting of the present Board, and all of the members were in attendance.

A number of very important questions were determined by the Board, and reports were received covering the activities of the College since the 30th of April last. The following is a summary of the more important decisions reached by the Board:

### RETURNED SOLDIER REQUIREMENTS.

Petitions were received from returned soldiers who had taken special Matriculation courses upon their return from active service and had been unsuccessful in the Matriculation Examinations of 1920. It was decided that concessions granted by the R.C.D.S. to returned soldiers be operative for Session 1921-22, but not thereafter, as follows: (a) Returned soldiers who served outside of Canada, be admitted upon submitting evidence of having successfully completed Arts Matriculation in eight papers. (b) Returned soldiers who saw service on an active front, be excused for Session 1921-22 from meeting Pre-Dental standard.

### PRE-DENTAL YEAR.

The Board placed itself upon record as being of the opinion that in the interests of the student it is desirable that the Pre-Dental Year be taken by R. C. D. S. students at the Royal College of Dental Surgeons, rather than elsewhere, but that where such course was taken elsewhere, all of the Pre-Dental subjects must be included.

However, the Board made exception that when Pre-Dental work was taken elsewhere, a language, other than those obligatory for R.C.D.S. matriculation, be accepted in lieu of French.

### REPORT OF BUILDING AND FITTINGS COMMITTEE.

The Committee reported that as building operations proceeded during the past summer it was found that many improvements were necessary, and that the total cost of the work would exceed the original estimate.

The Committee reported that the new wing was well on toward completion, and that the Dissecting Room had been equipped and ready to receive classes about the middle of October.

Detailed statements were submitted, showing that the total building and equipment expenditures during 1920 would total well over \$100,000.



DEVELOPMENT DURING PAST FIVE YEARS.

Statements were presented serving to show the marked development of the School of Dentistry of the R.C.D.S. during the five year period from Session 1916 to Session 1920, inclusive. The enrolment of students increased during this period from 345 to 887. The Faculty increased in number from 47 to 81, and the salary budget from \$34,500 to approximately \$100,000.

REGISTRATION—SESSION 1920-21.

The Superintendent reported the following registration of students:

Pre-Dental .....	75	
Freshman .....	165	(1 woman)
Sophomore "A" .....	162	(5 women)
Sophomore "B" .....	161	(2 women)
Junior .....	183	(6 women)
Senior .....	141	(3 women)
	<hr/>	
	887	(17 women)
Dental Nurses .....	32	
	<hr/>	
TOTAL .....	919	

RECIPROCITY IN CREDENTIALS—MEDICINE AND DENTISTRY.

A reciprocal arrangement was made between the Dental and Medical Faculties, which has the effect of giving to a graduate of one Faculty, credit of one Session toward graduation in the other. The effect of this regulation will be to admit graduates of Medicine to the Second Year of the five-year Dental Course, and to admit graduates of Dentistry to the Second Year of the six-year Medical Course.

SUBJECT OF THESIS M.D.S. 1921.

The subject of the thesis for examination for Master of Dental Surgery, 1921, was decided to be "The Prevention of Dental Diseases."

DEFERRED PAYMENT OF FEES OF WAR VETERANS.

Through co-operation with and promised assistance from the Ontario Government, the Board decided to defer the payment of fees of worthy veterans, amounting in the aggregate to \$12,000. A Committee, composed of the Secretary, Dean and Superintendent, was appointed to communicate with the parents of applicants and determine sum to be loaned to each veteran who had applied for assistance, according to the needs of each case.

## TECHNICIAN, X-RAY DEPARTMENT.

The Board decided upon a modern equipment for the X-Ray Department, and appointed Mr. C. F. Butt, Roentgenologist, who served at Christie Street Hospital during the war, to take charge of X-Ray work in the College Infirmary.

HONORARY DEGREES—M.D.S., AND REPRESENTATIVE ON SENATE  
UNIVERSITY OF TORONTO.

The Board decided to confer the Honorary title of Master of Dental Surgery upon Doctors C. N. Johnson, H. R. Abbott, and A. E. Webster, at the Annual Commencement in May, 1922, and appointed Dr. Seccombe as representative from the R.C.D.S. on the Senate of the University for the ensuing term.

## APPRECIATION OF DR. W. R. GREENE.

Appreciation was placed on record of Dr. Greene's valuable services during the past two years, and regret that change of residence necessitated Dr. Greene's withdrawal from the membership of the Board.

## LICENTIATES' FEE AND EXTENSION COURSES.

The Board decided to organize Post Graduate work throughout the Province, and provided for the remuneration of Clinicians or Lecturers who may visit local centres at the request of the Post Graduate Committee of the College.

With a view to defraying the expenses of extension work, the Licentiates' Fee was raised to \$3.00, and local societies throughout the Province were requested to consider the placing of the Licentiates' Fee at \$5.00, the additional funds to be used in publishing bulletins and carrying on study classes and clinics in different parts of the Province.

---

THE NEED OF OCCLUSAL RESTS.—In all forms of removable bridge work or partial dentures, where clasps are used, some form of occlusal rest is necessary as a means of providing against subsequent settlement of the case. If this precaution is not observed, complete loss of occlusion and usefulness will soon follow.—*Hart J. Goslee, Dental Summary.*

TO MAKE BAND THAT WILL NOT BECOME UNSOLDERED.—Cut the band three times the gauge longer than dentimeter measure. Bevel the ends to be soldered, one from inside, the other reverse, bevelled ends to lap one and one-half times gauge of band. Solder with one-half or one-quarter millimeter square of solder. Use muriatic acid or borax for flux and plenty of heat.—*Joseph Homer, D.D.S., Boston, Mass, Dental Summary.*

# Dental Treatment and National Health

## RECOMMENDATIONS AND SUGGESTIONS TO EDUCATION AND PUBLIC HEALTH AUTHORITIES.

THE urgent need for providing adequate and skilled dental treatment for conserving the health of the children and of all classes of the community was strongly emphasized in the concluding recommendation of the Report of the Departmental Committee on the Dentists Act as follows:—

“In conclusion, we wish to state very strongly that, in our opinion, the State cannot afford to allow the health of the workers of the nation to be continuously undermined by dental neglect. Steps should be taken without delay to recognize dentistry as one of the chief, if not the chief, means for preventing ill-health, and every possible means should be employed for enlightening the public as to the need for conservative treatment of diseased teeth. The dental profession should be regarded as one of the outposts of preventive medicine, and as such encouraged and assisted by the State. Treatment should be rendered available for all needing it.”

In view of this, the British Dental Association desires to bring to the notice of Education and Public Authorities the appended Report of the National Dental Service Committee, as adopted by the Representative Board of the Association on May 16, 1919, and now revised and brought up to date.

### NATIONAL DENTAL SERVICE COMMITTEE.

#### *Report to the Representative Board.*

(1) The Representative Board having accepted the report in which the National Dental Service Committee stated in general terms the conclusions at which they had arrived, and having re-appointed this Committee, it seems to be the natural and logical function of the Committee to proceed with the elaboration of the general principles already laid down, and to submit for the consideration of the Board, in detail, a scheme for an efficient National Dental Service.

(2) The Committee are confirmed in their opinion by the “Report of the Departmental Committee appointed to inquire into the extent and gravity of the evils of dental practice by persons not qualified under the Dentists Act.” The Report of the Departmental Committee is in the hands of all members, and has, doubtless, received their careful consideration. Therefore, the Committee need only refer to Section 5, dealing with dental disease in relation to the health of the people, and to Sections 8, 9, 10, 11, 12, where the treatment at present available is reviewed, its inadequate nature demonstrated, and



effective dental treatment for the whole population is recognized as an immediate and imperative necessity.

(3) The Interim Report of the Ministry of Health Consultative Council on Medical and Allied Services contains (Pars. 116 to 127 inclusive) the outline of a scheme for making dental treatment available for all classes of the community and for the co-ordination of all dental services with the general plan of medical services. Your Committee are in sympathy with the ideas underlying the scheme suggested, and have expressed their general approval of the proposals of the Report. As, however, it is evident that if and when the scheme is actually adopted, a considerable time must necessarily elapse before it can be in complete operation, they are of opinion that in the interval it is imperatively necessary to extend the present inadequate provision of public dental services as rapidly as circumstances will permit. The dental services which the Committee have in view include the following:—

(I) Dental treatment for expectant mothers and for children up to 5 years of age.

(II) Dental inspection and treatment of all children of school age.

(III) Dental treatment for all adults, whether entitled to National Insurance benefit or not.

(IV) Dental treatment as an essential element in the cure of tuberculosis and of venereal disease.

(4) The Committee are aware that much valuable work has already been done in most of these divisions of this proposed National Service. The treatment, however, is irregular in its application and limited in its amount, and a rapid and wide extension is necessary if the desired effect upon the health of the nation is to be obtained; and efficient organization and co-ordination are no less necessary if waste of effort, of material, and of public funds are to be avoided.

(5) They therefore again place on record their conviction that, “in order to co-ordinate the dental service throughout the country and to control effectively the public dental officers, there should be a Dental Section of the Ministry of Health under a Dental Director.” Such uniform control would permit of the establishment of central dental clinics by local health authorities, where by suitable arrangements and at different hours the treatment of the first three of the above-mentioned classes would be possible by the same staff. This would not only result in economy of equipment, rent, and time, but would also afford a necessary relief to the dental officers, upon some of whom the nervous strain of continuous work on young children might become intolerable. The central dental clinics here suggested correspond to the dental sections of the Primary and Secondary Health Centres as suggested in the Interim Report of the Consultative Council on Medical and Allied Services, and would be capable of being either linked up with or absorbed in such centres at any time

on the adoption of the complete scheme or any modification of it.

(6) The Committee suggest that wherever the dental treatment is of a relatively permanent and continuous nature, and where the volume is sufficient, the work should be done by specially appointed dental officers, working at fixed salaries, who should be responsible to the local health authorities, either directly or through the Chief Dental Officer to the Authority. That where necessary they should be assisted by sufficient numbers of assistant dental officers, either whole or part-time. That where part-time officers are appointed, they should work in sessions of a stated number of hours, and their remuneration should be on a time basis.

(7) The Committee consider that the dentists entering the Public Dental Service should have the prospect of a satisfactory career, that there should be adequate remuneration, the prospect of advancement, and of pension or retiring allowance after a definite period of service. The Public Dental Services have in the past been staffed by two classes of dentists—first, those who wish to make a career of Public Service, and, second, those who take up the work for a time with the intention of ultimately taking up private practice.

If the best type of dentists are to be attracted to and retained in the services, it is essential that the fullest inducements should be offered in order

(a) To increase the number of dentists who aim at making a career in Public Dental Service; and

(b) To retain in the services for a longer period than has been usual, dentists who intend to revert to private practice.

The Committee believe that the provision of pensions after a fixed period of service would be a great factor in accomplishing the first object, and would suggest that the second could be accomplished by grafting on to the superannuation scheme provisions entitling an officer to a substantial gratuity on retirement from the service after a minimum of ten years' approved service.

#### REMUNERATION OF DENTAL OFFICERS.

(8) The Committee think it desirable that some indication of what they regard as adequate remuneration at the present time should be given. They therefore recommend as follows:—

That the minimum salaries of whole-time dental officers should be on the following scale:—

(Schedule varies from £600 to £1,000 per annum for Chief Dental Officer).

That the minimum salaries for dental officers employed in the London County Council area should be 10 per cent. higher than the above scale.

That this scale of minimum salaries should be subject to the provisions of the Bonus Scheme of the Civil Service National Whitley Council Cost of Living Committee, and that for the purpose of cal-

culating bonus additions the scale should be deemed to include all bonus additions up to April 1, 1920.

That the minimum remuneration of dental officers working part time should be at the rate of £2 2s. per session of not more than two and a half hours.

(9) The Committee have considered the question of the supply of the numbers of dental officers necessary for the staffing of such a comprehensive scheme, and are of opinion,

(a) That in the present state of the profession it would not be possible to obtain a sufficient number of qualified dentists to enable every department of such a scheme to be fully manned within any reasonable period of time.

(b) That a rapid extension of school dental clinics offers the best means of effectively combating dental disease, inasmuch as: Treatment is easier to organize; (2) early treatment is largely preventive in character; (3) instruction in oral hygiene is easier to impart during school life than at any other period, and (4) that for the time spent upon the work greater results are to be looked for from this form of public dental service than can be attained in any other direction.

(c) That given the conditions stated above—adequate remuneration, the possibility of advancement and of retiring allowance—that it would be possible to attract a sufficient number of qualified dentists to staff a complete school dental service within a reasonable period of time.

(d) That it is in the highest degree desirable that school dental officers should in every case be fully qualified dental surgeons.

(10) The Committee desire to make the following recommendations under the various heads of National Dental Service already indicated.

#### I.—DENTAL TREATMENT OF EXPECTANT MOTHERS, AND OF CHILDREN UP TO 5 YEARS OF AGE.

(11) In putting forward suggestions for the effectual accomplishment of this very urgent and important work, the Committee have been influenced by the following considerations:—

(a) That this is not a case in which the necessity for treatment is of a temporary nature, or likely to decrease in extent, but rather to increase as its importance and benefit become more widely appreciated.

(b) That the chief demand for treatment will be found in large industrial areas, where on account of local travelling facilities the cases may be readily assembled for treatment in one or more central clinics.

It is, therefore, suggested that the work would be done most satisfactorily by whole-time dental officers, working on the terms already



stated, that suitable female assistance should be supplied, and that the service of an anæsthetist should be available.

(12) The provision of dentures for the adult patients would be an important part of the work of the clinics. It is recommended that central laboratories be instructed whenever possible, in which the mechanical work of a number of clinics might be done. In cases where the institution of such laboratories was impossible, contracting out at fixed prices might be arranged.

(13) When, on account of local circumstances, it was found that the work could be most suitably overtaken by dental officers working in sessions of a few hours per week, the remuneration of those officers should be on a sessional rate.

(14) Such appointments should be open to all Licentiates in Dental Surgery in the locality, and appointments should be made after advertisement of the post in the local newspapers.

(15) The previous suggestion as to co-ordination might be made effective by the work being done in the building used as a school dental clinic, a Primary or Secondary Health Centre, or in a dental hospital where one was available.

## II.—DENTAL INSPECTION AND TREATMENT OF ALL CHILDREN OF SCHOOL AGE.

(16) The Committee would suggest that in carrying out the recommendation of the Departmental Committee's Report, par. 116, "the Committee attach the greatest importance in the interests of the general health of the community, to the early establishment in the area of each local education authority of a complete scheme of dental inspection and treatment" the precedent afforded by the School Medical Service should be followed. In particular they would suggest, that:—

- (i) There should be on the staffs of the Education Departments of England and Scotland, dental officers responsible for the supervision, inspection, and co-ordination of the dental work done in local educational areas.
- (ii) That in the area of each local educational authority a whole-time dental officer should be appointed, who should be responsible for: (a) The dental inspection and treatment of the school children in his area; (b) the tabulation of statistics relating to school dental inspection and treatment, and for the preparation of annual and other reports to the authority; (c) the instruction (by lectures and other means) in elementary oral hygiene of teachers, school nurses, children and parents; and (d) who would act in an advisory capacity to the authority in dental matters.
- (iii) That where necessary assistant dental officers be appointed who would be engaged daily in the work of inspection and treatment.

(17) The Committee have considered the question of whole and part-time dental officers as applied to a school dental service. They recommend that, as a rule, the employment of whole-time officers is preferable.

(18) The question of the extent to which female assistants may with advantage take part in the work of the dentist in school and other clinics has been before the Committee.

(19) They are unanimous in recommending that no dental operation such as filling, extracting, or scaling should be performed by any but a qualified dental surgeon, except as in (20), but that subject to this reservation every assistance which would permit the dental officer to do his work speedily and without undue fatigue to the patient or to himself should be developed to the greatest possible extent.

(20) The Committee would suggest that in suitable cases and under careful regulations senior dental students might be allowed to work in such clinics, and obtain certificates before sitting for their final examination.

(21) In all public dental work, but particularly in connection with school dentistry, the ideal is not the multiplication of fillings and extractions, but the ultimate diminution of the necessity for such treatment, and it is hoped that from the outset an important part of the dental officer's duties will be the giving instruction to teachers, scholars, nurses and parents in the means by which such operations may be avoided by the proper care and use of the teeth.

### III.—DENTAL TREATMENT FOR ADULTS, WHETHER ENTITLED TO BENEFIT UNDER THE NATIONAL INSURANCE OR NOT.

(22) The evils arising from lack of dental treatment among the larger part of the adult population require no elaboration. The case has been proved to demonstration and is epitomized in the Departmental Report already frequently referred to. It only remains to provide the remedy, and the necessary machinery for its application. That remedy cannot be found in any modification of "benefit" under the National Insurance Act for "in normal times only half the adult population is insured . . . the half remaining outside the Insurance Act comprises a majority of women who suffer more from dental defects than men and whose need is probably more pressing even than that of insured persons." To combat this great evil then, some special machinery must be created and there are two lines along which this may be done.

(a) By instituting in all parts of the country panels of private practitioners, who for a fixed scale of fees will undertake to do all the necessary work either at their own surgeries or in specially fitted dental clinics.

(b) A State Dental Service may be instituted, by which whole-time salaried dental officers would do the work in specially fitted dental clinics with laboratories attached for the necessary prosthetic work.

The provision for dental treatment for the Army during the late war furnished an example of each of these methods and renders a comparison possible and valuable.

In the earlier part of the war, the dental treatment of the troops was rendered by panels of civilian dentists working in clinics established and fitted by themselves, giving part-time service for fixed fees.

In this way a very large amount of dental treatment was given. Later the Army authorities established a system of dental treatment completely under their own control and as a branch of the Army Medical Service, in which the treatment was given by commissioned dental officers working at Army dental centres both at home and abroad, with completely equipped and staffed laboratories for the necessary prosthetic work. This later system continues.

(23) In considering this question it must be borne in mind that the Army authorities were intent, during a time of great emergency upon providing the most efficient machine for meeting and overcoming a national danger. Immediate, local, in a sense temporary efficiency was required and the dental policy was framed to effect this. Far other is the aim of a State Dental Service, which while grappling with present necessity, has yet the wider aspect of future national health and well-being before it, and it is with this difference clearly in view that the example and experience of the Army in the most extensive dental experiment ever undertaken must be studied.

(24) Two defects in the civilian panel system may be noted as justifying its abandonment: (a) The practical impossibility of effective supervision and inspection, and (b) the great expense as compared with the system which succeeded it.

These defects are inherent in any such system and therefore the Committee recommend that in the provision of dental treatment of the adult population, a State Dental Service should be instituted in which whole-time salaried dental officers shall be responsible for the treatment.

(25) The treatment at least in large industrial areas, where the necessity for the service is most marked, would be by central clinics fully equipped with the necessary mechanical laboratories. Patients requiring dental treatment are almost invariably able to travel reasonable distances, but smaller country towns and rural areas could be dealt with from the larger centres by the means which are already familiar in school dental treatment in such cases.

(26) While the Committee are agreed in thus recommending a State Dental Service on these lines for the dental treatment of the adult population, they recognize, as already stated in par 9, that it would be impossible in a reasonable time to institute such a service properly equipped and staffed for the work, and they believe that any attempt to rush forward such a scheme would result in disappointment and in serious waste of public money.

(27) They, therefore, recommend that every effort should in the



meantime be made to meet the immediate requirements by the encouragement of the means of dental treatment already available:—

- (i) By the extension of the system of factory clinics established by the owners of certain large works. This might be done by the granting of subsidies from National Health Insurance funds towards the cost of establishment and upkeep—a condition of the granting of such assistance being the right of inspection on behalf of the Ministry of Health. Such clinics should be established in all works and industries over which the Government exercises control.
- (ii) By affording support and assistance to the Public Dental Services established by members of the dental profession in various parts of the country in a manner similar to that suggested above for factory clinics on similar conditions of inspection.
- (iii) By establishing in certain of the large industrial areas experimental clinics working on the lines laid down in this Report, in order that experience might be gained as to the best methods of working under varying conditions.

(28) The Committee would suggest that the effective organization of these various agencies could be speedily accomplished, would not involve great capital outlay, and would afford a very desirable means of experiment, out of which might grow the more complete scheme of National Dental Service as already outlined.

#### IV—DENTAL TREATMENT OF TUBERCULOUS PATIENTS PREVIOUS TO OR DURING THEIR RESIDENCE IN SANATORIA, AND OF PATIENTS SUBJECT TO TREATMENT UNDER THE VENEREAL DISEASES ACT, 1917.

(29) The Committee would suggest that under suitable precautions treatment in these cases might be given at a clinic dealing with the other divisions of Public Dental Service, if such were available, or more suitably in the case of tuberculosis in specially fitted-up dental operating rooms at Sanatoria. They regard it as undesirable that such treatment should be carried out at the private surgery of any dentist; nor should any scale of fees for different dental operations be arranged. The dentist should work entirely on a time basis for which the remuneration should be on a higher scale.

(30) Dental treatment for disabled and discharged sailors and soldiers under the Ministry of Pensions. The Committee consider that this is a department of Public Dental Service which must tend to diminish, and which may ultimately cease before State Dental Service can be brought into being. The present system of doing the work by panels of dentists working on a fixed scale of fees, need not be interfered with provided that control of the operations of the panels and decisions as to variation in fees be vested in Committees formed by the local practitioners on the panels and that a system of central supervision and inspection be instituted.

(31) In conclusion the Committee would desire to summarize their conclusions as follows:—

That in the first place the efforts of the profession should be concentrated on obtaining a complete school dental service.

That dental work in connection with maternity and child welfare centres should be organized on the lines suggested in the Report.

That pending amendment of the Dentists Act no attempt should be made to inaugurate an extensive system of State Dental Service but that the immediate needs of the population should be met as recommended in pars. 28 and 29 of the Report.

(32) The Committee would again express their conviction that an effective system of supervision and inspection is essential and that this supervision and inspection should be done by dentists responsible to the controlling authority.

BRYAN J. WOOD (*Chairman*).

C. F. PEYTON BALLY.

W. H. GILMOUR.

WALTER HARRISON.

EDWIN HOUGHTON.

W. H. JONES.

J. W. A. MCGOWAN.

H. A. MAHONY.

E. Y. RICHARDSON.

---

## Dr. Theo. G. Lewis, Deceased

---

THE Profession will learn with regret of the demise of Dr. Theo. G. Lewis, who practised Dentistry in the City of Buffalo for many years, previous to 1891, at which date he assumed the Presidency of The Buffalo Dental Manufacturing Company.

In 1865 Dr. Lewis first publicly exhibited the original Automatic Plugger, and it was his deep interest in mechanics that led him in the direction of Dental manufacture. His wide activity and intelligent research in the field of Dental mechanics are indicated by the number of Dental appliances bearing his name as inventor or designer.

Dr. Lewis was a remarkably public-spirited man. When he retired from practice he gave his entire professional library to the Buffalo Grosvenor Reference Library and during the succeeding years made yearly donations of value.

The June Bulletin from "The Grosvenor" of this year contains the following mention:

"Dr. Theo. G. Lewis, upon being asked for advice concerning some eight or ten new dental text books, replied that they were good, but not to buy them, as he would present them, which he did."

His love for music led him to maintain an amateur orchestra, which he conducted at his home. Once or twice each year they went to The Buffalo State Hospital and gave a concert to the inmates. Dr. Andrews, the superintendent in those days, assured the writer

that following each such occasion for weeks the behavior of the poor unfortunates under his supervision responded with marked improvement, both mental and physical.

Many a boy under the Doctor's teaching graduated into Buffalo professional orchestras, and several are now leaders of our best orchestral organizations.

Dr. Lewis in all his undertakings was most thoroughly painstaking. Nothing that ever came out of the factory of the B.D.M. Co., since his presidency, could be made more artistic or more perfect in its construction. This has frequently been commented on both by Dental dealers and by our Profession.

Dr. Lewis' discriminating appreciation of all works of art was remarkable. The contents of his beautiful home attest especially to this gift of discrimination. It is a matter for consolation, too, that he retained fully all his brilliant faculties to the advanced period of his ever active life.

---

## Advances in Pure Nitrous Oxid-Oxygen Anesthesia

---

**D**R. E. I. McKESSON, Toledo, Ohio:—Primary saturation of the patient with nitrous oxid fails in some cases to produce sufficient relaxation for certain operations. Nitrous oxid produces muscular relaxation when it is sufficiently concentrated in the tissues and associated with enough oxygen to prevent anoxemic rigidity. High concentration of this gas in the tissue is required to displace the non-anesthetic diluting gases. Secondary saturation, following momentary deoxygenation, intensifies nitrous oxid anesthesia and produces sufficient relaxation for any operation. Secondary saturation is readily lost by subsequent errors in the mixture administered, leaks of air into the apparatus or the patient's air passages and probably by absorption of air through the abdominal cavity and skin requiring occasional resaturation in some cases. Its successful and safe employment depends upon an apparatus capable of inflating the lungs with oxygen should the patient be crowded, intentionally or accidentally into spastic apnea. It depends also upon an accurate interpretation of the signs of anesthesia, but disregarding the presence or absence of cyanosis as an anesthetic sign. Secondary saturation is followed by no postanesthetic sequelae which are detrimental or which may be attributed to its use. I believe it is safer for the patient than an ether sequence or combined gas-oxygen ether and convalescence is better when even the small amount of combined ether is avoided.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**STIFFENING CANAL POINTS.**—Gutta percha canal points may be stiffened to any degree desired, and at the same time rendered sterile, by using tincture of iodine, in glass point container. Flow iodine over points just enough to color them, but not to cover them. Allow to evaporate. Points in twenty-four hours will be ready for use. If not stiff enough to suit repeat until point is dark brown. Iodine crystals seem to vulcanize the gutta-percha and form a coating, rendering the points sterile under almost all conditions.—*A. R. M., Dental Cosmos.*

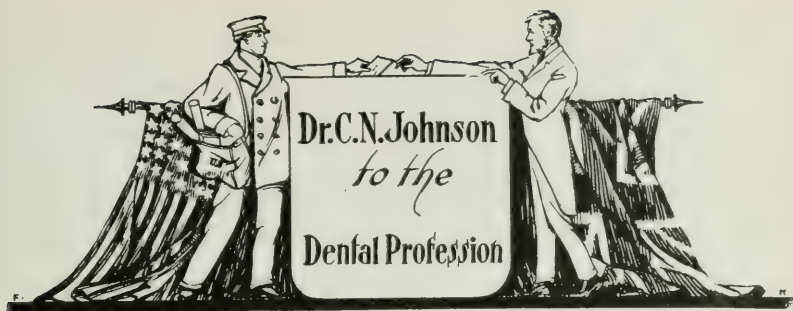
**AMATEUR DENTISTRY IN THE TRENCHES.**—"It is surprising how easily one takes to different jobs and how one 'turns one's hand' to all sort of trades out here," writes a soldier correspondent from the trenches, "and, although the work may not be done in a style to please a critic it is, nevertheless, 'done.' For instance, when we are hut building every man is a carpenter—of a sort, and when road-making—well, I think they are all foremen. Personally, I have practised as a hairdresser since the first week in the country, and even if it is not the latest Bond Street cut that I give them—well it suffices. I have now taken up dentistry, and so far have had two victims—I mean patients. One extraction took place in the R. E. Store in daylight. There were no forceps handy, so a pair of wire cutters were brought into use with excellent results. The other case was in the trenches. We were working in a trench one night, and one of the infantry asked to borrow my pliers to pull out a chum's aching tooth. With confidence gathered from my previous practice I offered to perform the necessary act of kindness. My services were accepted, and by the light of a candle 'the deed was did.' He sat on an empty ammunition box in the bottom of the trench, his chum held the candle, I held the pliers and eventually the tooth, and when I gave the tooth to the long suffering one he threw it over the parapet towards the German trenches, saying 'Souvenir for the Allemands.'

"Many thanks for the bundle of papers each week. I am going

along fine now, and next time I write I will give you some idea of what it is like in a hospital 'somewhere in France.' ”

CONTACT POINT IN GOLD CROWN RESTORATION.—It is important to restore the contact point when constructing proximal inlays. This aids in preventing the food from being jammed between the teeth and injuring the gums. Orthodontists have shown the vast amount of disturbance in the normal occlusion of the teeth which has been accomplished by the failure of dentists to restore contact points, gingival margins, cusps and other important anatomical parts of the teeth, when constructing inlays or other types of fillings. —S. Herder, (Dental Summary).

EXTRACTS, THOMAS P. HINMAN, D.D.S., ATLANTA, GA.—Now we come to the important question of piers. I do believe in vital piers, as much as possible, and I certainly think that under our present methods we can do practically all bridge work on vital piers. If we cannot do otherwise, put in a little denture, but let the pulp live. Well made partial dentures are far better than poor bridge work. \* \* \* How many of us make gold inlays? Occasionally I see a case that looks as if the dentist who made the gold inlay, picked up a piece of putty the color of gold, and daubed it in the cavity. If we are going to put in gold inlays, why not carve the occlusal planes properly? I have seen a number of instances where the ability of the patient to masticate food was decreased forty to fifty per cent., due to the fact that the occlusal planes could not come in contact and could not naturally grind the food substances. It is just as easy to carve those planes in putting in the inlays, in making restoration of the part of the tooth that has been lost, and bringing it back to the natural condition, as it is to put in an artificial plate with the proper occlusal planes. \* \* \* Are we able, I ask you, to know the oncoming of these irregularities? A large percentage of irregularities are due entirely to habits. How frequently has a child come into the office of the dentist to have the mouth examined where he can readily see the beginning of irregularities, and how frequently those who practise orthodontia have been told by the parents that their former dentist had told them to wait until the child was ten or twelve years old before doing anything with those irregularities? That is too late. Ten or twelve years is too late. When we pay proper attention to the child and examine the child's mouth with the idea of preventing irregularities, then we have performed the greatest possible service to the child and to our profession. \* \* \* I am thoroughly convinced after many years' experience that the average man will get better results with the combination of modelling compound and plaster than with either one used separately.



## Dental Activities in Chicago

TO indicate something of what is happening in Dental Societies in Chicago, it is only necessary to note the following schedule:

"North Shore component society meets the first Monday of October, December, February and April. Kenwood meets the first Tuesday of these months. North Suburban meets monthly—first Tuesday. West Suburban meets monthly—first Thursday. Englewood, monthly—second Tuesday. Chicago Dental Society, the parent body, monthly—third Tuesday. West Side, monthly—third Thursday."

Imagine what this means, when good live meetings are held by each Society. Some of the topics discussed during the December meetings were as follows: "Prophylaxis and the Treatment of so-called Pyorrhea Alveolaris," by Dr. Austin F. James. "Impression-taking, Materials and Appliances Used, Diagnosis, Surgical Preparation of the Mouth, Articulation and Articulators, Selection and Adaptation of Teeth," by Dr. J. E. Dolson. "Classification of Edentulous Patients from Mental and Physical Standpoints," by Dr. John B. LaDue. "Porcelain Jacket Crowns," by Dr. W. T. Reeves. "Modelling-compound Impressions,"—demonstrating the method, necessary implements and appliances, by Dr. John H. Hospers. "The Rational Status of Radiography in Dental Surgery," by Dr. Clarence O. Simpson of St. Louis, Mo.

As announced last month Dr. Simpson appeared before the Chicago Dental Society itself, and presented his subject in a very interesting way. He demonstrated by slides the dangers of making mistaken diagnoses with the X-ray, and proved conclusively, what has so frequently been stated before, that the only safe way of making a diagnosis is to study the history of the case, as well as the clinical records, in connection with the radiographic findings. Many a mistake has been made by jumping at conclusions from X-ray evidence alone, and the most progressive and sane among our radiographers have been pointing this out for some time.



Quite a delegation from Milwaukee, Wisconsin, came down to attend this meeting—at least forty of them—and they were entertained at dinner by the Chicago Dental Society before the meeting. This interchange of courtesies between the profession of the two cities is a very pleasant thing to contemplate, and when the National Dental Association meets at Milwaukee next August, it is certain that the Chicago men will be found working for its success as loyally as the Milwaukee men themselves.

The great annual event of the Chicago Dental Society will be held this winter at the Congress Hotel, beginning Thursday, January 27th, and lasting three days. It will be in the nature of a big clinic and Mouth Hygiene Meeting, and also a banquet. No progressive practitioner can afford to miss this event. We hope to see our Canadian friends here in large numbers, an added attraction for them being the fact that among the list of essayists and speakers we have our own Dr. Wallace Seccombe, Editor of *Oral Health*, Toronto, and Dr. A. W. Thornton, Dean of the Dental Department of McGill University, Montreal. Chicago opens its arms, and bids you to come.

C. A. Johnson

---

### Abuse Prohibits Use—A Quotation

---

WHILE many may feel that the cutting off of alcohol as a beverage may deprive them of some of their liberties, as well as their pleasures, medical men as a whole, we believe, feel that a temporary prohibition at least should be beneficial to the health of the people in the years to come.

Drugs and alcohol have been useful servants in the hands of physicians and dentists. But both have been found to be delusive and dangerous masters in the hands of the untrained.

The judgment of the laity is too often influenced by prejudice; problems of this sort should be guided by competent sanitary and health authorities. However, a trial is to be made of National Prohibition for a time, and physicians should embrace this opportunity to study the effect of total abstinence upon health and disease.

Kaiser Alcohol has been invited to abdicate on July 1st. But he will still continue to be the same useful therapeutic servant. Later he may become a boon companion to some. But it is hoped that never again will he rule as a licentious King.—*Pharmaceutical Advance*.

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 283 Russell Hill Road, Toronto, Canada.

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, JANUARY, 1921

No. 1

## EDITORIAL

### “Dead” Teeth and “Devitalized” Teeth

MODERN Life Insurance Companies are keenly interested in all movements calculated to improve the health and prolong the lives of the people. The larger Insurance Companies are now spending large sums of money annually in health propaganda among their policy holders and the general public. All such efforts are to be commended. Insurance Companies who undertake educational work should, however, fully assure themselves that the literature they publish upon health subjects is in accord with the scientific thought and best judgment of recognized practitioners.

One of the largest companies publishes a quarterly magazine, known as *The Imperial Life-Guard*. In the Life-Guard for December, 1920, the subject of “Bad Teeth” is discussed under the general heading, “How to Keep Well,” and some of the statements appearing therein will be somewhat in the nature of a surprise to the Dental Profession. The following quotation speaks for itself:

“Having the teeth ‘fixed up’ by killing the nerves, filling and sealing up the cavities, means that future trouble will likely arise.  
\* \* \* A mouthful of gold is a menace. \* \* \* A devitalized tooth is a dead tooth and is likely to act just the same as any other foreign body embedded in the tissues. If a tooth cannot be filled or otherwise treated without killing the nerve, it should be extracted.

“How many hard-working business men with beautifully gold-decorated, devitalized teeth, have noticed their usual energy de-

creasing—a feeling of getting old prematurely—and wondered what the cause could be? How often have they regained their old-time vim and feeling of well-being soon after having old, dead, root infected filled teeth removed? Again, how often have they become cases for the physician or surgeon because the trouble progressed unrecognized?

"Ask your modern, up-to-date dentist his opinion regarding the dangers from dead mechanically sealed up teeth. With luck such teeth may cause no trouble for years, but the odds are a long way against this.

#### SAFE-GUARDS.

"1. Visit a good dentist twice a year.

"2. Have those dead teeth X-rayed once a year. Serious root trouble, which often is not apparent outwardly, can be brought to light by the X-ray.

"3. If X-ray plate shows evidence of disease, take it at once to your dentist and have the root-infected teeth extracted.

"4. Remember that the infection is easily carried from teeth to vital organs of the body."

Many statements in the above article are so out of harmony with the best thought of the Dental Profession, that to the "modern, up-to-date Dentist" they sound positively ridiculous.

The Dental Profession fully realizes the need for public instruction in the prevention of dental disease and the care of the teeth, and stands ready to co-operate in every possible way with other agencies working along similar lines. But surely publishers might be expected to first submit manuscript of this sort to the official committees of the Dental Profession, which are specially appointed to deal with matters of this kind.

It is unfortunate that any "health" publication should associate without question "a mouthful of gold" with dental disease, as though the "gold" and the "disease" were related. And to then refer to "devitalized" teeth as being "dead" teeth. The advice in Safe-Guard No. 2 to "have those 'dead' teeth X-rayed once a year" is made ridiculous through the writer's apparent misconception that the words *dead* and *devitalized* are synonymous terms, and Safe-Guard No. 3 apparently presupposes that the dental X-ray is taken by someone other than a dentist, a diagnosis made, and then,—(when the treatment has been determined) "take it at once to your dentist and have the root-infected teeth extracted." Apparently the author of the article is worthy to be elected an honorary member of the so-called 100% Club. Many people who feel free to thoughtlessly advise their friends to have their teeth extracted, are much more considerate of their own teeth. Thousands upon thousands of devitalized teeth have been saved in health by dental surgeons and continue to render good service to their owners. Dentistry stands for the extraction of all teeth that cannot be made healthy, but Dentistry also stands for the saving of the tooth, in the interests of health, efficient mastication, and natural appearance, in every case where the tooth can be saved in a condition of health.



## Dental Treatment—Ontario Workmen's Compensation Board

THE following is a copy of the regulations of the Workmen's Compensation Board regarding injured workmen requiring dental treatment. It is only in unusual cases where the Board deals directly with the dentist. It is considered, by handling the matter as outlined, it will simplify the question as to dental work, and frequently avoid delay in workmen receiving proper attention:

### Copy of Letter Sent by Board to Injured Workman.

In regard to your recent accident, the Board desires to inform you that in case it is found that you have suffered permanent injury to your teeth, you will receive an award of compensation for this, and that it is left to yourself to make arrangements for any dental work that may be necessary, and to pay for this work yourself out of the moneys which will be paid you by the Board.

If you find it necessary or desirable to assign a part of your compensation to your dentist for the purpose of getting the work done, it will be in order for you to do so, and a form of assignment for that purpose will be sent to you upon request. The Board, however, will not be responsible for any dental work which you may get done, unless the same is authorized or approved by the Board.

The compensation which is paid for loss or injury to teeth is intended to cover not only the cost of dental work, but also to include an allowance for the permanent injury where it is not possible to make the teeth as good as before.

It is thought well to explain these matters to you so that you will understand the situation and be able to do what is best in your own interest.

Yours very truly,

THE WORKMEN'S COMPENSATION BOARD.

## Sound Bodies in Demand

THOUGH the personal hygiene movement has been under way for many years, public interest was rather desultory up to the time of the war. Hygiene, however, is now gaining recruits. Never before have so many people realized the importance of taking care of their bodies, and we believe the general physical improvement of the race will be one of the benefits for which the war eventually will be given a large measure of credit.

The man with a diseased tooth was not wanted in the army. Ills that had been considered of minor importance, being endured or ignored by the civilians, who "had no time to waste on petty things," were found to be matters of concern in the army, and only sound men were acceptable as soldiers.

It may be a long step from rigid army rules to Industrial Hygiene, but if a diseased tooth, or other physical defect, impairs the usefulness of a soldier, will not the same ill lessen the usefulness, the earning capacity, of the civilian?

That is the thought behind the personal hygiene movement which is taking root in the popular mind, and which will lead to the people taking better care of themselves. The result of the war may not be without lasting benefit to the nation, as we should become mentally, morally and physically a stronger and healthier people.

### Our New Cover Design

IN designing our 1921 cover the artist, Mr. F. R. Halliday, has made use of an old illustration of Saint Appolonia, who has been accepted as the Patron Saint of Dentistry, and whose life is recorded in manuscript of the fifteenth century.

St. Appolonia was born in Alexandria, and lived in the third century. As a Christian she was tortured by having her teeth broken and extracted, after which she was burnt at the stake. When under torture she is said to have prayed that those who remembered the day of her martyrdom, and in their prayers realised the pain she suffered, might never have toothache or headache.

The artist has symbolized modern dentistry by the Lighted Lamp, the Books, Microscope and Chemical Apparatus, thus illustrating vital phases of modern dentistry, namely: Study, Scientific Practice, and Research.

### Waterloo County Dental Association

THE last meeting of the Waterloo County Dental Society was held in the office of Dr. L. Koepfel, in Kitchener, when Dr. Irvin Ante, of Toronto, gave two very interesting clinics. In the afternoon Dr. Ante gave a clinic covering Hall's Impression Method, and in the evening Removable Bridgework.

All of the members of the Society expressed themselves most cordially regarding the thoroughness with which Dr. Ante conducted these clinics, and found them of great practical benefit. The hope was expressed that Dr. Ante would be able to appear before the Society again in a few months, and give the members the benefit of other clinics covering Prosthetic phases of Dentistry.

The Society also decided to recommend to the Board of Directors that similar clinics be encouraged throughout the Province, as it was thought that no better way could be found to elevate the standard of the Profession, or to bring the members together with a view to a mutual understanding and the development of a fraternal spirit throughout the Profession.

**FOR SALE.**—Four chair dental office and practice in Canadian city of thirty thousand population. Must be sold to settle estate. Communicate by wire to Bence, Stevenson & McLorg, Barristers, etc., Saskatoon, Sask., Canada.

HE is not fit to live who is not fit  
to die, and . . . . He is not  
fit to die who shrinks from the joy  
of life or from the duty of life.

—*Theodore Roosevelt.*





K. W. KNAPP, D. D. S.,  
*Des Moines, Iowa.*

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, FEBRUARY, 1921

No. 2

## A Definite Standardized Technic for Casting Inlays and Other Small Dental Castings\*

K. W. KNAPP, D.D.S., DESMOINES, IOWA.

MR. Chairman and Members of the Toronto Dental Society, as I look over your faces it seems to me we are already friends. I do not know when I have been in a place where I was so enthusiastically received and felt so much at home. The impression some men in the States have of the men in the east, (and when we think of the east we think of this part of Canada) is that they are inclined to be a bit cold, but if this is an indication of Canadian coldness a Palm Beach suit would be uncomfortably warm.

I wish to thank you for your attention during the clinic this afternoon, and to say I am proud of having an opportunity to speak to you gentlemen. I should like, if it is in my power in any way, to make some return for what I got from a man who comes from Toronto, and who gave us so much help and inspiration. I refer to a paper by Dr. Wallace Seccombe on "Diet in Relation to Teeth and Health." I had the good fortune to hear his lecture at Iowa City, and was so impressed by it that on my return I immediately put new principles into my practice and my home, with gratifying results. These principles I believe to be sound, and they are being so recognized, not only in Iowa, but in other States I have visited.

With your permission I should like to quote from the beginning of a series of articles on casting, which are to appear in "The Dental Summary" during the ensuing year.

If one wishes to realize fully to what extent the casting process has entered into the practice of Restorative Dentistry to-day, let him try for a moment to think what it would mean to practise without it.

\*Address delivered before the Toronto Dental Society, December 13, 1920.

Richmond, or open-faced crowns, instead of three quarter inlays for anterior bridge abutments; amalgam or large, time-taking, back-breaking malleted foil operations for posterior restorations, and gold shell crowns for posterior abutments; bent wire or band clasps instead of cast clasps for removable bridgework; swaged cusps and soldered backings instead of porcelain tips and cast anatomically correct pontics. One might go on for some length, but this list is enough to make one thankful that the casting process is a fact, available to any man with energy enough to master it. Our debt to Dr. Taggart is a great one, for no matter who may have first used it, his is the credit for presenting it in a form that could be used. When first presented it was hailed as a quick and easy method for producing gold restorations, and was so treated, with the consequent inevitable failures that lack of careful technic must produce in any procedure in Dentistry. This necessity for attention to detail was carefully expounded by Dr. Taggart, but was disregarded by many, and as a result, castings generally are not what they should be.

There has been an advance, of course. The introduction of different systems which advocate certain definite procedures has had a tendency to raise the plane higher, but there is still room, and plenty of it, for further advance. Certainly no fair-minded dentist can see his and other men's inlays fail, after a comparatively short time, without realizing that marginal fit is absolutely vital to success. Smoothness of cast is, of course, a prime requisite, but only so far as to insure a more perfect marginal fit, which is the real "pot of gold" after all. If we will look back through these last fifteen years we shall realize that this marginal fit is relative. In the first few years of casting history it was rather expected that a certain amount of cement would show after the inlay was set and polished. This was excusable to a certain extent, for it was apparently the best we could do. As time went on, an earnest endeavor and research brought forth newer ideas and methods, this margin discrepancy became relatively less until to-day we are demanding perfection, which is as it should be. It may be said right here that the degree of perfection reached is attained only by a close study of and strict adherence to certain physical and chemical laws governing the behavior of materials and forces employed in the process of casting. More individual effort and laboratory experiment must be indulged in to attain the highest degree of perfection. It does not suffice to simply follow blindly instructions or directions for using machines or materials, without knowing the rules or reasons for those directions.

If every dentist who uses the casting process would prepare a difficult cavity, such as Mesio-occluso-distal cavity in a molar, and then spend just one evening a week in making wax patterns and castings for it, the whole plane of casting technic would be raised



tremendously. If one really wants to know what results he is actually getting, the making of casts for cavities in technic teeth out of the mouth will show him for a certainty. If he can cast such a type as the above so that the marginal fit is so perfect as to defy detection of any discrepancy, he may rest assured that the same technic will produce the same result in the mouth. It would seem, however, that upon those words "the same technic" hinges the whole problem, for to actually use the same technic means that the cavity should be prepared, the wax warmed and pressed into the cavity, the temperature of the wax maintained, investment materials mixed and manipulated, the wax eliminated and the mould dried, the gold heated and the pressure applied, in the same way in each and every case. And how often is this done? In fact, by using some of the methods employed, how *can* it be done? In consequence of the variations, some of them extreme, the results obtained vary greatly.

For several years the writer made castings following a sort of hit or miss method, with the usual results. About four years ago, dissatisfaction with these uncertain results caused him to try to develop some definite process, whereby the results could be foretold and deliberately determined. It is firmly believed that point has been reached, and in this presentation an attempt is made to present a definite standardized technic for dental castings. This technic is presented with a full realization that it is not the only method for producing correct castings, nor is it presumed to be the last word on the subject. It has been thoroughly tried out, however, each step has a definite reason for being, and finally it has given and is giving uniformly accurate results, which, after all, is what we are all striving for.

Different types of castings require, of course, somewhat different treatment. We shall consider first, therefore, the construction of a gold restoration of lost tooth structure, in other words a cast gold inlay.

It is not my purpose to take up in detail cavity preparation. There are some things, however, which must be said about this phase of the subject in order to fully realize the possibilities of correct casting. One phase which I would like to bring to your attention is the fact that cavities may be prepared probably more quickly, and certainly with a great deal less pain by the use of stones rather than burrs. The stones used are chiefly Miller's mounted stones, and should be kept thoroughly lubricated at all times with hot water.

It should be noted that at all times I am not considering either 22K. gold or pure gold, as I do not find sufficient strength nor do they cast as sharply as some of the gold alloys. In as much as we are using these hard golds it is possible to keep all of our steps and cuts considerably more shallow than otherwise. As a consequence

the vitality of the pulp is safe-guarded to the point of practical certainty. For purposes of illustration, let us consider the preparation of a sound molar for a mesio-occluso-distal inlay to be used as an abutment for a bridge. The first cut is made with a 5-8 inch Joa Dandy carborundum disc, cutting from the occlusal, taking off the contact point, and carrying the cut down to the gingival line. In making this cut the stone is held in such a manner that the plane is slightly away from the perpendicular toward the centre of the tooth. It thus provides from the very beginning for certain withdrawal of the wax pattern. The same sort of cut is made at the distal with, in this case, a safe-sided disc, to prevent marring the approximating tooth. These cuts are then deepened slightly, carrying out the buccal and lingual margins far enough so that we are absolutely certain to bring them to a self-cleansing area; and by self-cleansing I do not mean by the use of floss, but by the correct use of the toothbrush alone. The next cut is made with a No. 344 stone in the right angle, carrying across the occlusal from mesial to distal, and cutting just deep enough to ensure a well marked and box-like occlusal step. In many cases, in fact in most cases, it is not even necessary to go through the enamel. The next step is made by the use of a No. 330 stone passed into the slot to carry out the grooves and fissures to self-cleansing areas. As the buccal and lingual walls are approached by the stone, it is tilted away from the perpendicular toward the buccal or lingual wall to provide for the removal of the wax pattern.

The occlusal step is then widened by the use of the No. 329 stone, which is of the cylindrical type, carrying out the same principles as in the use of the No. 330. The occlusal step should be quite shallow but as broad as can be, consistent with the strength of the buccal and lingual cusps. The mesial box cavity is prepared with a No. 327 stone, placing the base of the stone at the predetermined gingival margin; allowing the stone to sink itself into the tooth to a depth of about one-half the thickness of the stone. It is held in such a manner that the inclination is again slightly away from the perpendicular toward the centre of the tooth. The stone is then swept buccally and lingually, maintaining the same depth, and as it approaches the buccal and lingual walls is inclined toward those walls as before. At the distal where the approximating tooth is present, the space made by the first cut is of course too narrow to allow of such a stone being used. Therefore, a small cross-cut fissure burr is used, starting at the occlusal and letting it work toward the gingival, and then sweeping buccally and lingually as before. Where space permits, just as soon as the No. 327 stone can be used, the surface is finished by the use of the stone on the interior walls. They are now gone over with the No. 331 1-2 P. stone, which gives them a smooth glossy appearance. The cavo surface angles on the occlu-

sal are now bevelled slightly; just enough to remove any short enamel rods with the No. 224 stone in the hand piece. The gingival margins are then bevelled slightly by the use of Black's marginal trimmers. The buccal and lingual margins both mesially and distally was smoothed by the use of a medium garnet disc, being careful to have the disc at such an angle that it will not cut more at the gingival than at the occlusal.

It will be noted that the attempt has been made to provide perfectly for the absence of any undercut, and that, if properly done, is sufficiently retentive in form. For abutments for anterior bridges there has never been, at least to my notion, anything given to the profession which so perfectly answers every purpose as that advocated by Dr. Tinker of Minneapolis. This preparation keeps the pulp vital, is aesthetic, and has sufficient strength to carry any load that should be put upon it as a bridge abutment.

I shall not go into detail of the preparation of this type of cavity, as it has been so thoroughly and beautifully described in his article in the Dental Summary of March, 1920. I would earnestly recommend that this article be not only read but studied, for a thorough understanding of Dr. Tinker's ideals.

One other preparation I would like to speak of briefly is that which may be made for a tooth from which a gold crown has been removed. I have found so few teeth carrying gold crowns in which there was not gingival irritation, that I remove practically every gold crown which I can, and restore in some other way. As a rule the reason for the poor gingival fit of these crowns is that the enamel, (particularly near the middle third,) has not been removed. We can, therefore, after removing the crown, make a typical M.O.D cavity, using a very shallow occlusal step, and then bevel the buccal and lingual cusps and walls in such a fashion as to give us a finishing line of sound enamel. We can then make a restorative which is a combination of inlay and overlay, absolutely avoiding gingival irritation and without covering, entirely, the enamel of the tooth.

**WAX MANIPULATION.** — Kerr's blue wax is used in this process because it is a medium-fusing wax, has sufficient strength to resist torsion at mouth temperature, carves cleanly, and may be added to in the mouth without difficulty. It must be handled properly if one is to get best results. A very common fault is to hold it in a flame until it becomes almost fluid on the outside, then withdraw quickly and repeat. If this method is used, it is absolutely unfit for use as it becomes flaky, granular, and the molecules are expanded so as to make its use very uncertain. I have obtained best results with Kerr's wax by softening slowly and gradually, using a series of quick heats and at no time allowing the wax to show a glazed surface. Again, for purposes of illustration, let us take the



case of a lower molar with a disto-occlusal cavity, the approximating tooth being present. A stick of Kerr's wax is used, softening the tip over a low flame in the correct manner above described, pressing it with the thumb and finger of the left hand as it is alternately heated and withdrawn until it reaches the stage where it feels workable, and yet maintains the homogeneous character while being so pressed; in other words not showing cracks or checks when bent. This softened end is now pressed back toward the centre of the stick in such a way as to envelop the harder centre, leaving it as a core surrounded by the softened wax. When a ball about the size of the little finger is worked up, separate from the rest of the stick, pinch it into a blunt wedge shape and press into the cavity from the occlusal; holding the finger and thumb of the left hand buccally and lingually, and forcing down tightly until the cusps begin to be felt under the finger tips. The patient is then asked to close, but not make chewing movements; for to do so at this stage would tend to distortion. In this case, the fingers and the approximating tooth act as a sort of matrix band, confining the wax; and the hard core in the centre acts as a plunger forcing it clear down to the gingival seat under compression; thus giving a uniform molecular consistency to the wax.

While the patient has the mouth closed, the lips are opened and the wax thoroughly flooded with room temperature water; it being understood that this means about 70 degrees F. The whole bulk of wax is then lifted occlusally from the cavity and dropped into a glass of room temperature water. It is then dried and examined, and it should show smooth, sharp, definite cavity outline. If there are any "scuffed" or rubbed looking places on the cavity surface, it is probably an indication that there is an undercut in the cavity which should be corrected at once and another wax pattern taken. If it has the correct appearance, the gingival margin is trimmed carefully out of the mouth, using a sharp lance, so as to leave just a little delicate line of plus wax at the gingival margin. This margin is the one over which we have the greatest concern, in as much as leakage at that point means, possibly more than at any other, inevitable failure. To carve it blindly, as must be done when in the mouth, allows the possibility of cutting too deeply and thus removing a portion of the wax which should seal this margin; and, moreover, trimming out of the mouth avoids any laceration of the delicate proximal tissues. By the removal of wax in this fashion, it will be found to contain on the surface a small round or oval shaped depression which indicates contact with the approximating tooth. If the surplus be trimmed away from this point in all directions, it seems to me that this will give the best and most accurately placed contact point possible. When this trimming is being done, it must



be remembered that the wax should be repeatedly dipped into a glass of room temperature water to keep it cool.

The wax bulk is replaced in the tooth, pressed to position, and the patient asked to close as before. Further trimming is then accomplished by the use of *cold* flat-bladed instruments, as heat applied to the wax at the margins does the very thing which I believe we should try to avoid,—namely, expanding the wax at the portion which is thinnest and thus making for greater possibility of warpage. At any rate, the occlusal surface, after the excess has been removed, is trimmed by the use of small-bladed instruments; allowing the blades to follow the inclined planes of the triangular ridges and cusps as guides, letting the blade slide on the planes before touching the wax. In this way danger of cutting inside the margins is avoided, and the side away from the wax is kept slightly ahead of the cutting side, so the wax is burnished tightly against the margin as it is being trimmed.

This seems to give a greater density, which is desirable at this point. The buccal and lingual margins are then approached with caution, using the same care and allowing the blade to rest on the buccal and lingual sides of the tooth as guides so as to again avoid cutting the wax inside the margins. If this plan is followed it will also be found that the natural contour will be reproduced. If the wax itself is carved toward the margin, this usually results in a flattened contour and also provides the chance of cutting too deeply at the margins and thus exposing portions of them. It must be expected that we can get from our mould, as a casting, nothing better than we put into it as a wax pattern; and therefore it seems to me that just at this stage we can show our individuality. I fully believe that the great majority of cases where the casting shows discrepancy at the gingival margin are not the fault of the so-called contraction of gold, but are due to the fact that the wax was not gotten down into the cavity seat in the first place. The cusps, grooves, transverse and marginal ridges and sulci were given to teeth by the Creator for a definite purpose. If these markings and carvings are not properly shown, or, what is worse, if the restoration has no carvings at all, that purpose is defeated and we then become mechanics and not sculptors and artists as we should be.

Occlusal surfaces, when they are restored as a whole, are usually carved much too broad bucco-lingually. It should be remembered that the distance from the mesio-buccal to the mesio-lingual cusps is, in nature, just one half the width of the tooth in the same diameter at the widest portion. This is nature's provision for adequate support for biting surface, and if this measurement varies as much as is sometimes shown by having the points of the cusps almost directly above the buccal and lingual sides, it means simply that

we are putting on the tooth nearly twice the strain nature intended it to have. The mesio-distal relationship should also be correct. Marginal ridges are not as high in nature as they are usually carved, and they will be found almost invariably to contain tiny spillways to provide for the escape of portions of the food during mastication. These should be reproduced. Embrasures should be carved as nature has them, and particular attention paid to the construction of and position of the contact points. These first two steps,—namely, cavity preparation and wax pattern making, are vitally important, in that they express individual ideals.

The other steps in the technic of producing a casting are just as important perhaps, but they are mechanical; while these two serve to tell anyone who may see them just what sort of dentistry in general we are producing.

The carving having been completed to our satisfaction, the occlusal surface is smoothed by the use of wash satin held over the finger tips and burnished toward the margins. Oil of a cajuput or chloroform should never be used on the wax pattern, in as much as it leaves a scum of soft mushy material which, on a margin, will probably cause discrepancy.

For M. O. D. cavities and all three-quarter preparations I use a matrix band made by taking a piece of 36 gauge copper band material, passing it twice around the tooth, and crimping with the tips of thumb and finger at the labial or buccal surface; leaving it somewhat loose to allow the wax to take a correct imprint of the gingival margins and yet tight enough to confine the wax to its correct position. The inside of the band is then vaselined lightly; the wax is warmed as before except that in this case no attempt is made to have the hard core but rather to have it equally soft. It is then pressed into the band from the gingival, the end rubbed slightly with the fingers to produce a shiny appearance, and it is then inserted over the tooth, holding the buccal or labial surface of the tooth against the buccal and labial surface of the band as a guide, and pressed firmly to position. Previous trimming of the band should be done to allow for complete and correct closure of the teeth. The patient is then asked to close tightly, and in this case make all the masticating movements possible. The wax is then chilled with room temperature water as before, the whole bulk removed with the band, dropped into a glass of water, the gingival margins trimmed, surplus removed, and further carving accomplished. In this case it will be necessary to add contact points; which is done preferably by adding a small drop of wax at the proper points.

Patterns for three-quarter crowns on the anterior teeth may be removed by the use of two small hooked explorers placed mesially and distally at about the contact point.

The use of room temperature water has been stressed for the reason that by its use we believe there is less chance of distortion due to temperature change. If the wax pattern be chilled with very cold water, or ice water, there is a tendency to contract. In the case of a M. O. D. pattern the tendency would be to contract from the buccal and lingual margins toward the centre, thus bringing the margin of the wax out of contact with the margins of the tooth. Also the bar of wax from the mesial to distal across the occlusal would have the tendency to contract, and the action would be very much the same as a lever; whereby the contraction would act as the power, the line angles at the junction of occlusal and axial walls as the fulcrum, and the proximal portions as the arms; the effect being to force the gingival extremities of the wax pattern out of contact with the gingival margins of the tooth. Dr. Price demonstrates that if wax be warmed and forced into the cavity under pressure, when the pressure is removed and the temperature raised, the tendency of the wax is to return to its original form. Therefore room temperature water, being more nearly the temperature of the tooth, will cause the least amount of contraction consistent with sufficient strength and hardness of the wax, and by maintaining this same temperature at all times even to the point of investing the pattern with room temperature water, will, I believe, keep to a minimum possibilities of wax distortion.

INVESTING. — A sprue wire of 15 gauge is now carefully inserted, after warming, into the wax pattern at a point on the marginal ridge. Its direction should be practically parallel with the plane of the occlusal surface, and if a stiff armed centrifugal machine is used for the casting, a mark should be made on the sprue former to indicate the position of the gingival margin. The pattern is then carefully washed, preferably in soapy water and then with alcohol, then thoroughly dried and set aside while the material is being mixed. I think we have asked too much of investment compounds in expecting one material to answer all purposes, and in this method it becomes peculiarly necessary to have Investment material which has certain definite properties. In order to gain the best results, I have found it advisable to use two types of material, one for the purpose of producing smooth surfaces, and the other to provide plenty of porosity for the boiling out of the wax, and also sufficient spaces to allow of air getting away freely during the process of casting. After a series of tests using many different materials on the market, I have found that the best results for this method are obtained by using a mixture of 7 parts of Kerr's Snow White Plaster and 4 parts of very fine silex. This is mixed in a dry bowl and the proportions obtained by measuring, not weighing. In order to get uniform results, I believe these materials should be definitely meas-



ured each time; therefore a level teaspoonful of this mixture is added to 30 minims of water to which a small pinch of salt has been added. This is mixed together with as little spatulation as is necessary to accomplish the result.

The pattern is then carefully painted by the use of a fine camel's hair brush, laying an even coating over the cavity surface of the wax, and being especially careful to work out any air bubbles which might be entrapped in the corners or pockets. This is then blown forcibly and tightly against the wax pattern, and more added until a ball of Investment is built up completely surrounding the pattern, and with approximately the same amount of material on all sides. This is then allowed to set until crystalization takes place; which, if salt has been added, will take about ten minutes.

The second investment is then mixed by adding ten teaspoonfuls of a mixture of plaster and coarse silex to 300 minims of water. This again must be spatulated as little as possible to put it together. It will be found that this proportion will make quite a thick mix, which it will be impossible to pour around the first Investment; therefore the ring is filled with this material, and the ball of first Investment inserted down into it, using a wavy sort of motion to avoid entrapping any air. It is pressed down until the sprue former is perfectly seated on the ring, and allowed to set; which again will take about ten minutes. I firmly believe in a thick mix; for, in the first place, the more thickly it is mixed the fewer molecules of free water will be present and therefore the fewer air spaces or holes on the surface of the Investment as the water is dried out; and, in addition, the thicker mix will be the stronger, with a greater resistance to the force applied by the molten gold entering the mould.

In eliminating the wax, I believe more may be done to make or mar the final results than in any other part of the process.

I believe about 90 p.c. of inlays which are not successful are made failures before they get to the casting machine, probably most of them in the process of burning out the wax.

It is not safe to heat plaster above approximately 400 degrees Fahr. There are two methods of getting rid of wax in the mould. The first is to dissipate the wax in the investment material by applying low heat, and then volatilize the residue by a continued and very much higher heat. In a series of ten tests, made by attaching ends of pyrometer wires to the outside of the ring in which wax patterns were invested, and cutting into the top of the investment so that progress of volatilization could be watched, it was found that the wax was completely volatilized at a temperature averaging 900 degrees Fahr. The inside of the mould where pattern would be, showed from 100 to 150 degrees less. Practically all investment materials contain plaster in different proportions, so that complete



volatilization necessitates this plaster being heated from 350 to 400 degrees higher than can be done safely without disintegration. When the gold is thrown out on this weakened surface it gives or bulges, producing warped castings.

Very beautiful castings can be made by carbonizing, but success in this method depends on knowing when the proper degree of carbonization is reached; and how can you definitely decide when it is not under-carbonized or over-carbonized? The wax is dissipated into the investment material by a low heat and then carbonized without carrying it to the point of volatilization, the idea being to have a carbon residue just filling the pores and interstices in the matrix wall. If this can be accomplished in every case, smooth, well-fitting castings may be produced. The difficulty seems to be to have this residue laid down perfectly. Can you conceive of two wax patterns, say a very small one as for a gingival inlay, and a large as one for a full jacket crown, leaving the surface equally covered with carbon residue, employing the same temperature for the same length of time? If the large pattern be under-carbonized, there will be a layer of carbon deposited on the matrix wall; and if the mould be placed on end this will be thicker on the lower surface. Certainly gold and carbon cannot occupy the same space at the same time, and if the mould is under-carbonized, the casting will be scant by just that thickness of the carbon layer. If, in the case of a small pattern, the mould be heated as high and as long as would be necessary to properly carbonize the large one, it results in an over carbonization of the smaller one. Proper carbonization of different sized and shaped wax patterns would appear to be a mathematical problem requiring to be worked out for each individual case. It can be done, of course, for beautiful, well-fitting castings are being made by men who have worked out this technic.

The logical thing, to me, however, seems to be to remove the wax as a body; simply by applying again the same principle we apply when boiling out wax when making dentures, etc. In any other process, when we wish to rid plaster or any other material of wax, we simply pour boiling water on it and wash it away. Why not in making inlays? We have often been told that water boiling in an inlay flask will ruin the case. As a matter of fact, the reason for this is because we have been using investment materials and methods of applying the heat which were not suited to the purpose. If investment materials be mixed with water, poured, and allowed to set, the mould contains two kinds of water; one the water of crystalization which combines with the plaster perfectly and causes set, and the other an excess of free water, most of which will flow out if sufficient heat be properly applied. If we make this free water, which is ~~not~~ needed in the mould, do some work, the wax

can be eliminated and our problem is solved.

As soon as the material is set, heat is applied to the ring so as to force away from the hot sides the particles of free water, just as water dropped on a red hot stove runs away to a cooler place and then volatilizes. This water must get out somewhere, and the open ends of the flask provide the only exit. In coming out it passes through the place where the wax is, softening the wax and washing it out of the only free exit which it has, through the sprue hole. The high plaster content makes the material strong enough to resist any explosive force of steam which may be generated, and it thus does not chip or crack, but leaves a clearly outlined pattern chamber; the elimination of the wax being accomplished at the temperature of approximately 212 degrees Fahr.

The mould must now be dried at a safe temperature. Carry the heat on to a point, after boiling it out, whereby we take it away from the direct heat as applied against the ring on all sides, at such a time that the free water has been thoroughly removed, and the mould dried without necessarily removing the water of crystallization.

In order to accomplish these results an automatic device has been worked out; thus removing wax and then the continued heat applied dries the mould sufficiently to make a casting certain. This device equipped with a timing mechanism and an automatic cut-off shuts off the gas, and the process is complete. In order to use the device properly the mould is placed in the heat chamber with the sprue hole down. The timing device is set for 7 to 8 minutes, depending on the gas pressure and heat units in the gas. The gas is then lighted, and the flames striking on the ring as above outlined boil out the water and wax in about two minutes. The continued heat plays on the side of the cast for 5 to 6 minutes longer, superheats the ring, and the outside layer of investment material. At the end of 7 minutes the gas shuts off. At this point a mirror held over the sprue hole should show some moisture, which indicates that the central portion of the investment has not been heated much above the 212 degrees Fahr. The latent heat continues through the ring and outside layer of the investment to the centre in about two minutes longer, at which time the mouth mirror is again applied and should show no moisture. In order to be sure that moisture would show if there were any present, I have found that the ring should still be sufficiently hot to produce a hissing sound when touched with a moistened finger tip. When these tests applied show no moisture and yet sufficient heat on the ring, the mould is ready to be cast into, in the case of overlays. For inlays, I find it better to allow the temperature of the flask to come back to approximately room temperature.

Heated in this manner, and using this investment material, it seems to me there is actually a slight expansion of the mould in all directions; for I find that in casting into a hot mould of this character my three-quarter and full crowns are fitting better than I have ever been able to get them before.

The temperature of the gold in casting is a decided factor in the production of a well-fitting inlay. I have carried through several cases with identically the same technic up to this point, and have then got decidedly different results by purposely changing the temperature of the gold. Gold expands when heated in a definite ratio, just as does any other metal. Therefore, if gold be heated white hot it is in a considerably expanded state. When it enters the pattern chamber it is of course limited by the pattern chamber walls, and therefore if it be white hot it will enter into a very tiny pore in the wall. Moreover it must contract in cooling as much as it was expanded, and, as shown by Marcus Ward and Travis of Ann Arbor, in cooling, the crystals arrange themselves in parallel lines so that the contraction takes place more nearly in one direction. Now if the gold be heated just above the melting point, it may be cast just as sharply if sufficient pressure be used, it will not be expanded to nearly such a degree, and will chill so quickly that the crystals do not have time to arrange themselves in parallel rows with the consequence that they sort of pull against each other.

The contraction is thus diminished, and the wax entirely eliminated in this method and thus there is no residue of carbon, the surface will be much smoother than where the gold was white hot.

In using the centrifugal machine of the stiff armed type, it is found that at the start the gold has a tendency to go in a direction opposite to that in which the machine travels. Therefore in one traveling to the left, such as the Monson, if we are to take full advantage of this force I believe the gingival margin should be placed to the right in the machine; so that when the gold enters into the pattern chamber it will actually be cast toward that margin first. In using a pressure machine this point is not important but I prefer, even in using that type of machine, to use considerably more pressure than is ordinarily given, and with the gold just above the melting point in order to get the best results possible. I think the machine itself is not so important as the knowing of the peculiarities of the particular type of machine used. In order to avoid the possibilities of over heating, the safest flame to use is that of a gas and air blowpipe. The nitrous oxide and gas, or oxygen and gas flames will heat the gold very nicely, but they are dangerous flames unless one uses them with great care and skill, in as much as the gold is heated so quickly that it is very easy to reach a point which is beyond that correct for smooth casting. In a centrifugal machine a



small square of asbestos sheathing is placed in the bottom of the crucible. This allows the heat of the blow pipe to be confined entirely to the gold itself, without the necessity of bringing the crucible or the arms of the machine to a sufficient temperature to allow the gold to be melted. A sufficient quantity of gold is placed in the crucible and the heat applied. The condition of the gold ready for casting is a difficult thing to describe, but it may be said that it should be brought to the point where the nuggets lose their integrity as nuggets, and become spherical in form. A slight scum or haze then appears on the surface of the gold. At the point where the tip of the flame strikes the gold, this haze will break away and start to move down the sides, and by slightly tapping the crucible the gold will seem to move easily from side to side and is iridescent in appearance.

When this point is reached the handle is turned very rapidly and this continued for several revolutions. The casting itself is probably made in the first half turn, and the continued turning simply maintains the gold under pressure until it is hardened. After the casting is made the mould is dropped into water and it will be found, if the technic has been correctly carried out, that the investment material will be almost as hard as it was originally, which proves there has been very little disintegration. The casting is freed of investment material and at this time it should be noted that there must be no silex on the inlay. If there is, it is an indication that either the gold or the investment has been overheated. It is then heated in the flame and dropped in diluted sulphuric or muriatic acid, neutralized with soda, and washed thoroughly. The surface is then examined for any small bubbles or nodules, and if there are any present they are removed.

The sprue residue is then cut off, and the inlay tried in the cavity, and it will probably need to be tapped once or twice lightly to thoroughly seat it. All margins are then dressed down with a fine stone, or preferably with medium garnet discs, and finished with fine sand; practically to the point where all it needs is final polish. Unless this trimming is done before cementation, it will usually mean that a thin film of cement is held under the marginal surplus, and when dressing down is completed after the cement has set, it may show a thin line of cement. This may be avoided absolutely by treating in the method first described. It has been my experience in noting inlays which have become loose, to find that the cement is usually either on the inlay or on the cavity surface. This leads me to believe that if either of these methods is followed a thin film of air is probably entrapped next to the surface on which the cement is not spread. I therefore make it a rule in cementing, to spread a thin film on both inlay and cavity. The cavity is first



thoroughly dried with alcohol or acetone and warm air, (the tooth being isolated by means of cotton rolls,) and the cement mixed to a consistency whereby it will not quite drop from the spatula. The cavity and inlay are now smeared with cement as described; the inlay placed in the cavity and tapped into place. I then have the patient bite on an orange wood stick. The mouth is then opened and the margins wiped clean of cement in one or two places to see if it has become thoroughly seated. If a cement line shows, it is seated still further, or else removed and reset.

Castings made in this way will be found to fit very tightly, and it therefore becomes necessary to use a cement with an extremely finely ground powder. The material I am using is Fleck's cement, which has these properties, sets reasonably fast, and has sufficient adhesiveness. When the cement has set, all margins are thoroughly gone over with fine sand and cuttlefish discs. The occlusal surfaces are polished with Ward's Svelto pastes on a tooth polishing brush. A lasting polish is given to all surfaces, and may be completely done in the grooves and sulci with hand and engine burnishers. This polish is one which is obtained by uniformly laying down or bending over the crystals of gold themselves and will therefore remain indefinitely.

The gold used for inlays is the gold formula known as Tinker T., and for 3-4 crowns and inlays as abutments for bridges or for inlays where stress will be brought upon thin surfaces I use one of the golds of the Ney Oro Series; preferably Ney Oro C. Some golds cast much better than others, due to the composition of the alloy. Golds which are high in copper must be heated very carefully and a reducing flux applied before casting. Ney's reducing flux is the material used. If the gold has not been over-heated the residue button may be used many times without refining. If it has been overheated it may be refined by first heating on a charcoal block, and then sprinkled with Ney's Oxidizing flux, and then pickled, and again heated and treated with Reducing flux.

It is of course impossible to go into complete detail of the casting process in the length of time suitable for a lecture of this kind. I have tried to bring out the main points of a technic, which, if carefully followed, will produce results that are infinitely satisfactory. I sincerely hope it will prove in your hands the success it has in mine. Again I want to thank you for your wonderfully kind attention.

#### DISCUSSION OF DR. KNAPP'S PAPER.

DR. MASON. — Any words I might add would be idle, in the face of the large audience we have. Dr. Knapp speaks of these inlays as we speak of them, or overlays, or onlays; in fact I have had patients refer to them as outlays.

About fifteen years ago, the late Dr. Cowan, of Peterboro, showed this same technic, or very similar technic, of cavity preparation and the casting of inlays.

I was delighted to hear the name of Dr. Tinker. I had the privilege of being in his office in Minneapolis, and seeing two patients on whom he was working, and I have never seen anything with the individuality in it that his work has.

Dr. Knapp this afternoon told of smoothing up his inlays by means of China silk, using it in different ways, and in using this particular material you will get the smoothest finish I ever saw on any wax pattern made in the mouth.

We have heard a lot of technic to-night,—some new and some old. In using a hard investment, with a centrifugal machine, it does not permit of the air passing as readily through the investment as it would through a more porous one.

If you are in the habit of using anything but a centrifugal machine, and attempt to apply this technic to them, you won't get results, but by adding certain parts of this technic to the technic you are already using, and still using the same machine you have been using, you will still get good results. For instance, the sprue-former for an air machine is an entirely different shape from that used for any other machine.

In using discs for cutting down the molars or bicuspid, I have never been able to keep the disc cool by means of water, but I have been successful by using powdered carborundum with all stones and all discs. This can be washed away, and will keep stones running absolutely smooth, and even fine discs will not break off at the end of the mandril and fall to pieces.

In cavity preparation I find pencil stones too large for the field of operation, and therefore find fissure burs much more effective.

In preparing a cavity, the seat of which in the average cavity is one mm. wide, it is impossible here to use a stone, and a fissure burr is imperative. I cannot cut them with these stones, because the sharp edge is so quickly worn off that you simply cut a round axio gingival line angle, which will not do, because all pressure will come on the occlusal surface. For my part, I would advocate burs for that particular part of the preparation.

In preparations for Carmichael fillings, sometimes when we wish to get added strength we place pins either one in the centre or one on either side of the median line and close to the gingival. If marginal ridges are essential on molars and bicuspid, they are ten times more essential on incisors and cuspids, because this marginal ridge protects the interproximal space edges more than on the others.

Referring to carving of wax, it is better to think of the trian-

gular ridges than it is of the sulci. In this way you will produce a more accurate occlusal surface.

If marginal ridges are in the right place on a tooth, the contact points must necessarily be in their proper relation.

In carving marginal ridges, it is essential that we take particular care that the mesio-distal diameter of the tooth, even down to measurements as fine as 1-100 part of an inch, is not altered, permitting of a change of relation in the arches, particularly with patients who are having orthodontia work done, because even these small measurements will change the relation of the tooth so that the orthodontist will be completely thrown out in his part of the work. Patients who are going to the trouble of having orthodontia work done are people who appreciate greatly the value of their teeth, and an hour or two extra time spent on the making of inlays so that these fine measurements are retained will be gladly paid for by the patient.

I find Kerr's wax softens or becomes pliable almost at body temperature, and therefore in handling of the wax when carving it will change by heat of the fingers, more so than Taggart's, which is a little harder wax.

For heating the wax I find an electric heater, in which the pellets are already warmed uniformly throughout, is better than heating over an open flame. I have found that I get better results than in using a wax with a hard core, because the wax heated uniformly throughout flows evenly under pressure in all directions. In taking a pattern I press my wax down into place and it flows out in all directions. I have the patient bite into the wax, which is held in by the approximating tooth acting as a matrix, and the gingival must be roughly trimmed to permit of the first removal of the wax pattern. The Willmott spoon is an ideal instrument with which to trim wax patterns. The edge of the spoon will pass over on to the margins of the cavity and trim the wax smoothly without making a ditch along the margin of the wax. The way to trim after the first rough trimming is with a round instrument, such as a root canal plugger, which, being round, will pass through the interproximal space without injuring the gum, and will not cut a ditch along the margin of the filling.

{ In burning out the wax, if we place the ring in an electric heater with the sprue former down, we get good results, because the wax will pass out of the sprue former and we will have a minimum of carbon left in the mould.

The heating of gold in casting is very important, and you must learn how much heat to apply. To do this it is necessary to take into consideration the variety of machine you are using, the amount of gold in the casting, and the amount of force you intend to apply



when making the casting. These factors all have a bearing on the amount of heat you would apply to the gold, and must be learned by the operator from his own experience. The larger the amount of gold, and the greater pressure, the less amount of heat is necessary to apply to the gold.

In comparing the centrifugal with the air machine, the objection to the latter is that if the air is enclosed tightly in the ring we always get an air cushion around our casting, but if there is an air vent made at the lower end of the ring, through which the contained air can pass out, then we get a casting which fits the investment just as tightly as with the centrifugal machine, because with the centrifugal machine the air does pass right through the investment.

The centrifugal machine which Dr. Knapp refers to is a stiff-arm centrifugal, and for my part I cannot see why a centrifugal machine with the movable slings is not a far superior machine. If we use a centrifugal with the slings, it is not necessary to place the inlay so carefully, as far as the gingival margins are concerned, in the machine.

I am very glad to hear Dr. Knapp mention the burnishing of the fillings. Burnishing gives a very fine finish, and also a very hard surface, to our gold. I am afraid a good many men have been a little negligent in this part of their technic.

DR. THORNTON. — It has given me a great deal of pleasure to listen to Dr. Knapp. In connection with his paper, there is a question in my mind regarding the hastening of the setting of Kerr's Snow White Plaster. The manufacturers say it is not desirable to do this, but if necessary it should be done with potassium sulphate, rather than salt. I do not know why, but possibly Dr. Knapp can enlighten me.

Dr. Thornton proceeded to present some important facts in relation to Dental Anatomy and the practical problems of dental practice.

DR. WEBSTER. — Why not spatulate investment? Why not use ice water to chill the wax?

DR. GRIEVE. — Are there any cases in the mouth where one tooth may be safely attached to another as a dummy for a bridge? As, for instance, in the case of replacing a lost lateral?

DR. KNAPP (CLOSING DISCUSSION) — I want to thank Dr. Mason for his thorough discussion, and especially for the exceptions he takes to certain parts of the technic advocated. I think for the most part these exceptions are due to the fact that he is talking from the view point of one technic, and I from a different one. The first point he made is that in using a hard investment there is danger of entrapping air and not getting a sharp casting in using machines other than a centrifugal machine. Now it is only

the ball of investment immediately surrounding the pattern that is made of hard dense material. The second investment is purposely made very porous so that air can get away. The dense material simply gives smooth surface, and being just a thin layer, allows the air to get out into the second investment where it quickly gets away on account of the great porosity.

In using stones the objection voiced by Dr. Mason as to the fact that they wear and become rounded is very true, and they must be trued up and the ends flattened by running on a carborundum stone frequently to keep them in proper shape. Wherever access is too narrow for these stones on the mesial or distal, burrs must be used. I merely intended to advocate their use where there was no danger of cutting approximating enamel.

Dr. Mason's point of the importance of maintaining the marginal ridges in their proper places and correct mesio-distal diameter is certainly well taken and I shall be more particular in the future to see that they are.

I have not experienced the same difficulty he speaks of in using Kerr's wax. However, it may be noted that the pattern is flooded very frequently with room temperature water, and during the carving out of the mouth is dipped frequently into a glass of water to keep from warping in the fingers.

I must take a decided stand in favor of heating the wax as described in order to get a hard centre and thus force the wax to the gingival margins under pressure. It is my belief that when wax is uniformly softened and pressed into a proximo-occlusal cavity without a matrix, the wax will flow to points of least resistance; that is buccally and lingually, even though confined somewhat by the finger and thumb; and it is for this reason I want a hard core to force it clear to the gingival seat.

If the wax is forced into all parts of the cavity so that the molecular consistency is equal, I believe there is less chance for warpage than otherwise. The reasons for trimming out of the mouth at the gingival margins are entirely for convenience and the ability to see just what you are doing and I am sure this part of the trimming is worth a trial. The centrifugal machine with slings movable to the right or left is certainly a superior machine, as the gold can be thrown directly into the sprue hole. The only trouble is that they don't make them that way any more.

Answering Dr. Thornton's question in reference to potassium sulphate as a hastener, I can see no difference between this and salt, although the former may be a better material. I have been very much interested in Dr. Thornton's talk on Dental Anatomy and am pledging myself to spend more time in this study during the coming year.

In answer to Dr. Webster I might explain that I advocate not spatulating the investment because I have found that spatulating lessens the amount of free water that will boil out. The scientific reason for this I shall leave to some one else, but if sufficient water is not left, the wax may not be thoroughly eliminated.

As to the question of ice water I think I answered that by saying I believed it caused contraction. If the wax pattern be thoroughly flooded with room temperature water, and by that I mean plenty of water, I think it can be chilled sufficiently to bring the whole body of wax to room temperature, even though it is in a tooth which has a high temperature, that is, open mouth temperature.

Answering Dr. Grieve's question I wish to say that I think there is one case in the mouth where one tooth may be safely hung on another as a dummy for a bridge, and that is in the case he mentioned, namely, supplying an upper lateral tooth by attaching to a 3-4 crown on the cuspid. This applies only in cases of normal stress. In case of an end-to-end bite I should attach to the central, or make a lug resting in a slot in an inlay in the central.

In case of a lower incisor, I have been following Dr. Tinker's method of making 3-4 crowns for the adjacent teeth, taking very little from the lingual surfaces of these teeth. This may give them a greater bulk and hence feel a bit clumsy at first, but the advantage gained in keeping the proper distance from the pulp, I believe offsets this bulky feeling which is unnoticed after a short time.

---

## American Institution of Dental Teachers

---

AT the annual meeting of the American Institute of Dental Teachers held at Indianapolis, Indiana, January 24th, 25th and 26th, the following officers were elected for the ensuing year:

President, Dr. Guy S. Millberry, Univ. of California, San Francisco, Cal.

Vice-President, Dr. A. H. Hipple, Creighton Univ., Omaha, Nebr.

Secretary-Treasurer, Dr. Abram Hoffman, 381 Linwood Ave., Buffalo, N. Y.

Executive Board, Dr. A. E. Webster, Royal College of Dental Surgeons, Toronto, Ont., one year.

Dr. E. D. Coolidge, Univ. of Illinois, Chicago, Ill., two years.

Dr. H. E. Wheeler, College of Dental and Oral Surgery, New York City, three years.

The next meeting will be held the third week in January, 1922, at Montreal, Que.



## A Nasal Restoration—By an Amateur

J. O. WELLERMORE, MINNEAPOLIS, MINN.

**T**O some of you, perhaps, the following article will prove uninteresting and the technique seem crude, but Brother Nilsson insisted that I write up the case and see that he got it before the 20th. Here it is:

Mr. ——— presented himself as shown in figures 1 and 2, having lost his nose and part of his cheek due to an operation removing an epithelial granuloma. The operation had been performed about three years ago and the immediate tissue shows a healthy regeneration.

A careful study of the opening showed a periphery partially supported by bone tissue and other portions, as under the eye, entirely unsupported. This made an accurate impression both difficult and necessary as any imperfection in the impression would make the piece ill-fitting and irritating.

A circle of softened modeling compound, resembling a doughnut, was introduced into the opening and pressure exerted from within outward until the compound slightly overlapped all the margins of the cavity. After it had cooled the ring was removed and all excess compound was cut away. Then by careful fitting, cutting and softening, the surfaces resting on unsupported tissue were relieved to very light contact, and the other surfaces regulated so the ring fit without any unequal pressure at any point. With the ring in place a plaster impression of the face above the mouth was taken, with the patient breathing through the mouth. The opening must be packed with gauze or cotton before this impression is taken to prevent the plaster from getting too far into the cavity as this would make the removal of the impression painful or even impossible.

The modeling compound should come away with the plaster and remain a part of it. The cast obtained from this impression is used to build on. Base plate wax was used to build up the nose and cheek plate to harmonize with the other features. The wax model was then tried in place on the patient and corrected to insure perfect adaptation. The inner surface was hollowed out as much as possible by cutting and scraping to remove bulk, using care to avoid undercuts.

A final fitting with a spectacle frame was then made to locate gold wire posts which were anchored in the wax. These posts extended far enough out of the wax so that when bent they were long enough to fasten the bridge of the spectacle frame.

The glasses were then removed and the model flaked and vul-



canized of light pink vulcanite and polished. The whole inner surface was then ground out with vulcanite burrs and scrapers until the whole piece was not more than one to one and a half millimeters thick at any one point, making the piece very light.

The patient was thoroughly instructed in adjusting and removing the case and instructed that any accumulations allowed to remain on the restoration would or could cause serious trouble. It has been in place for nearly two months and no irritation has occurred yet.

Figs. 3, 4, 5 show the restoration from various angles and Figs. 6 and 7 show views of the inner surface.

The afternoon the patient received the case the weather was quite moderate and the match in color was excellent, but returning later on a chilly morning the face was rather blue but the restoration remained a cheerful pink, a detraction, it is true. When comparing the pictures, however, I think you and I would much rather put up with a slight loss of perfect color harmony at all times rather than the gaping wound shown in Figs. 1 and 2.

As I said in the beginning of this paper the method may seem cumbersome and roundabout to some of you experienced in this work but it is original as far as I am concerned, having had no experience previous to this case. I think perhaps, I believe, with the patient, that the means justify the result obtained.

Dr. B. T. Williams and Henry P. Boos offered suggestions that aided considerably.—Xi Psi Phi Quarterly.

---

### Elgin Dental Society

THE members of the Elgin Dental Society met at St. Thomas, on Dec. 15th., when Dr. W. J. Laker, of Toronto, gave a very successful and practical clinic in Exodontia.

It was shown that infection at the Apex of a tooth can, and should be removed. Infectious conditions were removed from sockets after removal of tooth, thus demonstrating the so-called "surgical removal."

In the evening a most appreciated paper was read by Dr. Laker, who pointed out the danger in removing too much oral infection at one sitting, also the great danger to patient if infectious matter is allowed to remain in "situ" even if tooth is extracted. The lack of systemic relief and favorable result were attributed generally to these causes. The too rapid, careless, and too extensive extraction of teeth with lack of surgical care of wounds came in for discussion. The practice of Dental Surgery today is to be carried on in a different manner than in the past, if surgical results are to be obtained.—C. B. Taylor, Sec'y E. D. Society.

# Abstracts and Translations—Bone-Grafting of the Fractured Mandible

BY GILBERT CHUBB, D.Sc., M.B., F.R.C.S.

THE cases described are sixty in number. All but three were gun-shot wounds and were operated on at the Queen's Hospital for Facial Injuries, Sidcup. They are consecutive and unselected cases and represent all the bone-grafts performed up to the end of 1919. In two cases the graft was lost owing to sepsis. In one case sinus formation resulted in non-union and the eventual absorption of the graft. In another case the graft, which extended from molar to molar region, is healthy and the wound healed, but union has not yet occurred at either end. In the remaining fifty-six cases, 93 per cent. of the series, firm bony union has been obtained. Fifty-one of the cases had edentulous posterior fragments, and in forty-three of these the loss of bone involves the region of the angle. In sixteen of the latter the loss involves the ascending ramus also.

In all but the first two cases the graft was obtained from the crest of the ilium. This source has several advantages. The size of the graft is practically unlimited so that all doubtful bone can be freely removed from the jaw fragments. The vascular nature of the iliac crest facilitates the subsequent union and consolidation of the graft. By varying the position on the crest it is possible to obtain a graft of a general curvature suitable to each case.

The aim has been to obtain a sound junction between the graft and the jaw fragments, the bones being so trimmed that they fit end to end with accurate apposition of the largest obtainable areas of exposed vascular bone tissue.

In this position they are firmly wired together. This technique was adopted in order to control the edentulous fragment. It allows the early exposure of the graft to the stress of muscular movement without the risk of disturbing the close contact of the bone tissue.

This early stress is a factor in determining rapid union. It was found unpracticable to obtain rigid post-operative immobilization by means of splinting; yet it was found that in over 60 per cent. of the successful cases union was of ivory hardness at the end of three months. Experience has led me to regard the chief role of the dentist's splint as being the maintenance of correct occlusion during the operation. Lingual deviation of the large fragments can be subsequently prevented by the interlocking of the splint when in closed bite, or by means of a flange.

The interval between the original injury and the bone plastic has averaged fifteen months. Pre-operative treatment has consisted in the



elimination of sepsis, the extraction of the teeth involved in the fracture or tending to cause malformation, the correction of the latter and the immobilization of the jaw fragments. At least three months have been allowed to elapse between the last visible signs of sepsis and the operation.

The chief factors producing malformation are defective dental occlusion, unopposed muscular action and scar contraction. When lost fragments bear teeth the usual deformity is a combined lingual roll or deviation. The free ends of the bone are drawn together while faulty occlusion of the molar teeth may cause the fragments to rotate till the lower teeth may lie horizontally in the mouth. In the case of the toothless fragment, the upper teeth impinging on the gum causes the fragment to shift outwards into the cheek and unopposed muscular action to elevate it to the outside of the maxilla. The inward roll if marked cannot be corrected. The teeth may be used for splinting and are then removed to prevent deformity. After previously acquired malformation has been, as far as possible, corrected, interlocking double Gunning splints are cemented on and bolted together in closed bite the day before the operation and in the majority of cases only removed from three to four months later.

The permanent character of the repair effected by bone-grafts can only be determined by time. In some cases more than a year has elapsed since the operation and successive radiographs only show progressive consolidation. It is often possible to recognize the uninterrupted passage of the bone architecture of the graft into that of the mandible.

The subsequent functional value of the grafted mandible depends on several factors, besides the permanent character of the graft and its bony union. Prolonged disuse results in weakness of the muscles of mastication and greatly increases the normal periodontal sensitiveness. These conditions are not permanent. Under the influence of stress and strain to which the graft is subjected in the normal use of the jaw, the architectural structure becomes modified in accordance with Wolff's law, and a compact layer of bone is formed encircling the central tissues of the graft. In several cases I have found the graft able to bear the pressure of a denture within a few months of the operation.

General opinion tends to the view that the free graft remains alive and takes an active osteo-genetic share in the union. Successive radiographs show a uniform increase in the opacity of the grafts. The behaviour of the graft in the presence of sepsis is suggestive. In one case of a large graft there was considerable suppuration, and a month later a large sequestrum came away. Union occurred at both ends and a radiograph showed the alveolar border of the graft of the whole anterior portion, in position and firmly united. The view

that the sequestrum was thrown off by the living graft is supported by three other cases in which small sinuses over the graft closed after the separation of one or more small sequestra from the latter, without leading to infection or interfering with the progress of union.—Lancet.

---

### Light in the Operating Room

---

THERE are seven rules to be observed in regard to light in an operating room. First: avoid bright walls which reflect the light into the operator's eyes; rather select green and brown colors which are more restful. Second: avoid flooding the entire room with light, especially toward the lower portion, towards which the operator's gaze is frequently directed, but rather concentrate the light on the field of operation and keep the balance of the room more or less in shadow. Third: never face a window; in case one is present, keep the shade drawn. Neglect of this precaution is frequently productive of great injury to the eyes. Fourth: avoid very large windows which flood the room with too much light; if present keep a portion of them shaded. An excellent plan in some instances is to equip the operating windows with two separate shades, one at the top and one which can be pulled up from below. In this way the light can be conveniently regulated at any period of the day. Fifth: if possible admit most of the light from a window at the operator's back. Sixth: avoid bay windows, which as a rule admit an excess of light and require a great deal of shading. Seven: make provision in the form of one of the many special artificial light reflectors for use on dark days and whenever needed.—Dr. W. H. McGehee—*Dental Summary*.

---

### Relaxants in Nitrous Oxid-Oxygen Anesthesia

---

DR. ANSEL M. CAINE, New Orleans, La.:—Nitrous oxid-oxygen would be the anesthetic of choice in all hazardous risks were it possible to secure adequate relaxation. What is sufficient relaxation for a surgeon accustomed to doing abdominal surgery under gas-oxygen anesthesia is insufficient for the surgeon who is used to the profound narcosis of etherization. Proper manipulation of the oxygen supply, slight positive pressure, warming the gases and preliminary medication as well as concomitant local analgesia all help in securing the desired degree of relaxation. In a certain number of cases however the addition of ether, chloroform or anesthol will be required. Working in a Southern climate I have found chloroform a safe, efficient and pleasant adjunct to gas-oxygen

anesthesia for relaxation. An even more satisfactory relaxant is anesthol, in which combination the depressant action of chloroform is offset by the stimulating action of the ether. It is my impression that less damage is done the patient with good relaxation under gas-oxygen-anesthol and gentle operative manipulation than with gas-oxygen alone and rougher surgery necessitated by inadequate relaxation.

---

## Pain in Cutting Hard Dental Tissues

---

CUTTING the enamel does not produce painful sensation. As soon as the amelo-dentinal junction is reached marked pain is usually experienced by the patient. Beneath the amelo-dentinal junction are located the interglobular spaces of Czermak which are completely filled with semi-fluid protoplasm. Pressure and heat produced by the revolving bur upon a relatively large surface area of fluid in this region are quickly transmitted to the pulp and hence pain is felt. Within the area of dentin which lies beyond this borderline zone sensation again is lessened until the advancing bur reaches within close proximity of the pulp. In carious dentin, excavation of the zones of complete disorganization and of decalcification does not produce sensation because the contents of the tubules are destroyed. As soon as the zone of turbidity is reached, again marked pain is manifested. Here the contents of the exposed dentinal tubules are subjected to intense irritation brought about by acidity and other products of bacterial metabolism. The surface tension of the fluids in the tubules is markedly altered, hence the quick response to pressure and thermal influences. Below this zone of turbidity, the "translucent zone" if Tomes is observed in chronic caries. This translucency of dentin is the product of a vital reaction. The chronic irritation of the odontoblasts causes the pulp to promptly respond by depositing adventitious dentin within the lumen of the tubules which necessarily lessens their diameter in varying degrees or even produces complete obliteration. Hence a smaller surface of the tubular contents is exposed to the advancing bur and, consequently, lessened sensation is felt. The gradual reduction of surface area of the dentinal tubules is a physiological process in the life circle of a tooth, hence sensitiveness diminishes with advancing age.—Herman Prinz, D.D.S., M.D., *Australian Journal of Dentistry*.

# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## ECKERMANN'S THEORY OF THE CAUSE OF DENTAL CARIES.

MANY theories have been advanced regarding the cause of dental caries. Among these we had the theory that caries was an inflammation starting from within the tooth; then came the acid theory; then the microbic theory; and lastly, the present-day theory—a combination of chemical and microbic.

Those who have become wedded to the chemico-parasitic theory of Miller will give a very doubtful reception to the new work just recently published by Eckermann. To those who have come across many clinical cases which are hard to explain under the generally accepted theories, much of interest will be found in this new explanation of the cause of dental caries. Even though Eckermann's theory fails to convince, it will undoubtedly arouse interest and create a new field for investigation.

Briefly outlined, the Eckermann theory is: Increased osmotic tension of the saliva (brought about by salts, chiefly sodium chloride) causes an osmosis of the blood-plasma up to the amelo-dental junction, setting up what the author has termed a "caries canal." In support of this theory Eckermann first advances reasons why the present chemico-parasitic theory must be wrong.

He points out that no one has succeeded in isolating one or more micro-organisms to which the loss of the enamel can be definitely ascribed. Pickerill has demonstrated the presence of the same micro-organisms in mouths free from caries as in those where caries was prevalent. Stained, but hard, dentine between a carious cavity and the pulp is free from bacteria. Bacteriological diseases have always arisen suddenly, spread, and afterwards disappeared, whereas dental caries has steadily progressed in severity. Caries never causes cachexia. Carious matter is free from odors. It can be claimed that every tooth has microscopic retention places; therefore, if one tooth is carious, why not all? In a body, buried in the earth for many years, the teeth offer resistance to decomposition, although carious teeth were present in life. Artificial caries has never been produced. It has been found that a negro race in South



Africa lived on carbo-hydrates, from which the fibrous element was carefully removed, yet they showed almost total immunity from caries. Milk—the primary food of man—is supposed to be injurious under the carbo-hydrate theory. Fillings with imperfect margins, giving lodgment to carbo-hydrates, often resist caries. Caries shows a mathematical regularity as regards its contour. Neglected mouths show a freedom from caries and vice versa.

Eckermann cites the following phenomena as being inconsistent with the chemico-parasitic theory: Natives of the Arctic region, who eat mainly meat, and also certain South Sea people, who eat mainly carbo-hydrates, are both free from dental caries. Food passes throughout the alimentary tract with increasing fermentation, and, during the relatively short period in the mouth, damages the most resistant tissue in the animal world. Apes of the same species in South America—those in captivity have caries, whilst those in the wild state never have, although they drink the same water and live under the same climatic conditions. Caries always penetrates directly towards the pulp. Pulpless teeth show a wonderful power of resistance. Buried carious teeth are found where death has stopped the progress of decay. Caries often appears symmetrically in certain groups of teeth. Caries shows regularity of contour. Anterior teeth are often decayed, whilst sulci in posterior teeth are free from caries.

A careful consideration of the foregoing facts led Eckermann to consider what elements of civilized foods could be responsible for the ravages of dental caries. After much careful investigation he decided that it was owing to the salt and saltpetre used so extensively as a preservative in modern foods. He tested the permeability of dentine and enamel, and found that though enamel was practically impermeable, the vast majority of teeth show histological defects, and osmosis can take place through such teeth.

Dentine also was found to be permeable, but more so from the pulp towards the amelo-dentinal junction than the reverse way. By tests *in vivo* the existence of a plasmic circulation through the dentine was proven, thus giving a function to the interglobular spaces, which hitherto have been regarded as faulty calcification.

Tests have been made to prove that the osmotic pressure of saliva can be raised above that of the blood by foods, particularly salt and sugar. With increased osmotic tension of the saliva, or with decreased osmotic tension of the blood, as found in certain diseases—as malaria or pregnancy—the plasmic circulation of the dentine is blocked. Miller and others found iron salts in carious dentine, but ventured no explanation of this phenomenon; but if Eckermann's theory is correct the presence of iron is easily accounted for as coming from the pulp fluids. All previous attempts to produce artificial caries have failed to reproduce the phenomena as found

*in vivo*. Eckermann, however, claims to have succeeded by means of sodium chloride sealed against the teeth in the mouth to reproduce a "caries canal."

One other feature not accounted for by the chemico-parasitic theory, i.e., immunity. We have all observed that after the thirtieth year of life a partial immunity is often acquired until later in life, when another susceptible period is reached. This period takes the form of gingival caries. Eckermann points out that as the pulp recedes with age, and particularly with vigorous use, the immunity to caries increases, and the susceptible area passes from the cusps towards the neck of the tooth in correlation with the degenerative process taking place in the pulp.—*Dr. W. R. Morris, in Commonwealth Dental Review.*

#### THE EFFECT OF TOBACCO ON THE VASCULAR WALL.

THE inhalation of tobacco or the injection of nicotine causes a contraction of the artery. This can be shown by the rise of blood pressure. In the novice there is always an initial rise of systolic blood pressure. In an excessive smoker the pressure rises and the pulse is unaffected.

The rise of blood pressure may be due either to a change in the heart rate, or to the increase in output, or to an indirect effort associated with the respiration. Careful observation of two healthy smokers showed that there was generally an increase in heart rate after smoking. Even when the increase was absent, the blood pressure showed distinct changes. The maximum and minimum pressure always rose slightly, the maximum the more, so that the "pulse pressure" tended to increase. This is the case when the rise of blood pressure is caused by a vaso constriction, therefore the increase in pressure may be independent of the heart rate.

Experiments have demonstrated that smoking causes a sudden increase in the average rate during the first half-minute of smoking. No preliminary slowing takes place, such as has been described in the case of animals after the introduction of nicotine. In some cases the blood pressure does not rise until ten or more minutes has elapsed. The average diastolic pressure rises gradually.

Lauder Branton has given the following statement: In animals nicotine causes slowing of the heart, with enormous rise of blood pressure. The rise of pressure is due chiefly to the contraction of the arterioles. This contraction is partly dependent upon the stimulation of the vasomotor centre in the medulla oblongata, partly also to a local action upon the arterioles themselves, as it is produced by the injection of the drug after the medulla has been destroyed.

It may be shown that nicotine causes an augmented adrenal secretion, and so must have some action on veins. The effect of

tobacco upon vaso constriction may be shaded somewhat by the fact that tobacco attacks the hemoglobin. Nicotine attacks the hemoglobin in the red corpuscles of the blood. The hemoglobin content may fall as low as 40 per cent. The largest portion of the oxygen is held in chemical combination with the hemoglobin. In other words, the amount of oxygen in the arterial blood depends upon the amount of hemoglobin there is in one cubic centimeter of blood. When the hemoglobin content falls, the oxygen supply is insufficient, and certain organic acids, such as lactic acid, may accumulate. Acids in slight concentration cause a vascular dilatation. Lactic acid or carbon dioxide may act to produce a dilatation. So the vaso constriction caused by tobacco may be shadowed somehow by its indirect action on the vaso dilatation.—*Tsang G. Ni, M.S., China, in The Journal of Laboratory and Clinical Medicine.*

#### CANCER WORMS IN RATS.

RESEARCH work on the worms which have been shown by Professor Fibiger, of Copenhagen, to be a cause of cancer in rats, is now being carried on in London by Professor Leiper. Professor Leiper solved, during the war, one of the most obscure problems of disease by finding the intermediate host of the Bilharzia worm. His discovery at once brought this disease, which has infested Egypt from remote times, within the scope of prevention. It was achieved within a very few months, though many previous efforts by other workers had not been successful. Lest there should be any misunderstanding about the rat-cancer, it may be pointed out that, unless indeed human beings were actually to eat the cockroaches which harbor the worm, they could not become infected, and even then there is no certainty that they would be infected. The life cycle of the worm seems to be: (1) Eggs eaten by cockroaches; (2) eggs hatched in body of cockroach and worms pass out from its intestines to its muscles, where they become encysted; (3) rat eats cockroach and becomes infected with the worms. The rat may now develop cancer. The worms in the rat produce eggs which are now passed out to be eaten by other cockroaches.

Thus it would seem fairly evident that this particular worm can have little to do with cancer as found in human beings. The worm was, however, unknown to science until Professor Fibiger found it. That there may be other worms, with similar powers of producing new growth, is a possibility. It is here that the new work in London is so interesting.—*The Times.*

---

FOR SALE.—Dental Chair in first class condition, a bargain. Apply C. A. D. C., 240 College St., Toronto. Telephone College 6132.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**PAINLESS REMOVAL OF PULP.**—A combination of one-eighth gr. of cocaine and one drop of carbolic acid applied to the pulp will, after five minutes, enable one to remove it perfectly painlessly.

**THE EFFECTIVENESS OF TOOTH WASHES.**—There are few persons now who have not the conviction that the scientific cleansing of the teeth and gums is very valuable, and the business in antiseptic dentifrices is obviously increasing, judging from the numerous public advertisements which appear in the daily press setting forth the merits of a great number of these preparations. Generally speaking, they are so composed as to render them well adapted for the purpose, and we have submitted a number of them to analytical examination. The choice of antiseptic is commonly confined to carbolic acid, thymol, peppermint, boric acid, benzoic acid, eucalyptus, and other essential oils, distributed in vehicles containing as an agent of attrition non-gritty chalk and as an alkaline medium soap. Experiments are usually quoted as to the actual germicidal value of these preparations *in vitro*, but, of course, it would be more satisfactory to have evidence of their real effect in the mouth, where very different conditions must, as a matter of fact, exist. The use of a tooth wash does not approach the conditions of a laboratory test, though there can be little doubt that a good deal of germicidal work in the mouth is done by the vigorous application of the tooth-brush, and it may be pointed out that the tongue may well be included in the process. To be effective, however, the action of all antiseptics takes time, according to the vitality of the organisms they encounter, and usually the tooth-brushing process does not occupy many seconds. This question of time-exposure is important, but it is very generally overlooked, and consequently the antiseptic treatment of the teeth falls short of that effectiveness which is shown to be the case in laboratory experiments. The tooth-washing process should be more prolonged; and the antiseptic wash allowed to remain in contact with the teeth and gums for some minutes, instead of seconds, before finally washing the mouth clear of antiseptic with plain water.—*Lancet*.





## Once More, the Pulpless Tooth

**I**T is safe to say within the past five or six years, the subject more often discussed among dentists than any other is that of the pulpless tooth. It has also taken up much space in medical literature, and has been handled from so many angles that it has produced confusion in the minds of medical men and dentists. No subject has ever been brought before the profession that has caused so great a diversity of opinion as this, and it is only just at the present time that an attitude of sanity seems to be approaching in its consideration. That the pulpless tooth has sometimes in the past been a menace to health there can be no question, and the agitation against it has done much good in the elimination of many of these teeth that in times past would have been permitted to remain. But the good that has come in this way has been more than counterbalanced by the needless extraction of thousands of pulpless teeth which were altogether harmless and which were calculated to prolong the life of the patient and contribute to his comfort in furnishing an adequate means of preparing his food for nutrition through proper mastication.

The hideous wrecks that have been made of many mouths are a serious reflection on the good judgment and balance of the men responsible for such mutilation, and the crimes committed in the name of so-called modern progress can never be atoned for in the next generation.

The effect of this constant agitation about pulpless teeth has had a peculiar psychological effect upon the people. Many an individual who has had in his mouth pulpless teeth that have been doing acceptable service for years suddenly discovers, as he reads in the public prints about the lurking evils which come from these organs, that he has not been feeling particularly well of late and that there is an uncomfortable sensation somewhere in his mouth which he had never before noticed. If it were not for the tendency of hu-

man nature the patent medicine men would never have heaped up the enormous fortunes they have at the expense of a gullible public.

To claim that all pulpless teeth are a menace to health is to run counter to the experience of more than half a century of close clinical observation. I happen to have in my pocket as I write three radiographs of pulpless teeth which tell at least one side of the story. One is an upper molar, and the other three are upper central incisors. These teeth show the canals filled and the bone in good condition around the apex. The patients have had no trouble with the teeth in any way, and no ailment that might logically be traced to the teeth. One central was filled twenty-one years ago, the two others twenty-two years ago, and the molar nearly thirty years.

Let us visualize the present condition of those mouths had those teeth been extracted when the pulps were lost. Long clinical experience with authentic records to back it up is more valuable in formulating a policy of practice than all the finely spun theories that were ever invented in the mind of man and in the ultimate it is results that count far more than speculative reasoning.

A healthy sign of the swinging of the pendulum was indicated by the trend of thought as expressed at the recent mid-winter meeting of the Chicago Dental Society. A tone of conservation was manifest throughout in the papers and discussions that would have been hailed as heresy a few years ago, and there is strong hope that both medical men and dentists are coming to their senses in their attitude toward this most important subject. But much harm is yet to be done before men reach a sane position in the matter, as evidenced by a single instance where a dentist recently decided that he should extract a tooth for a member of his own family, in which he had previously placed an inlay, and in which he recalled that the pulp was nearly approached and might possibly die sometime. Through fear that the pulp *might* die he was going to sacrifice the tooth because of his conviction that pulpless teeth should not be permitted to remain in the mouth. Idiocy has seldom gone much farther than this, but it is only in line with what is happening in many quarters in our beloved profession today. To carry this idea out to its ultimate conclusion every individual should be opened up and the appendix removed; every tonsil should be taken out, every gall bladder should be separated from its unhappy owner, every kidney should be dissected away, every great toe nail should be cut off, because forsooth these various organs *might* some time become diseased. Can logic be carried to greater lengths than this? I think not.

C. H. Johnson

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada.

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, FEBRUARY, 1921

No. 2

## EDITORIAL

### The 1921 Chicago Meeting

THE Dental Profession has come to expect great things from Chicago when the members of the component dental societies get together and decide to entertain their confreres from distant points. The 1921 meeting, however, quite "out-Chicago-ed" all previous achievements, and the four thousand dentists who attended the sessions during the last week of January left the city feeling a debt of gratitude for the many benefits received.

Few practitioners realize the days and hours of hard work involved in such an undertaking, and while in some measure the rank and file of the Profession doubtless appreciate the efforts of their officers to carry conventions through to a successful conclusion, we do not always comprehend the tremendous personal sacrifice that is entailed.

The profession generally ought to keep this thought in mind, and when convention plans miscarry, as they sometimes do, avoid an unfortunate and too common form of "stigmatism" which leads us to *magnify* the single fault while we *overlook* many virtues.

The men who organized and carried the Chicago meeting through so successfully were President George G. Knapp, Vice-President E. D. Coolidge, Secretary M. M. Printz, Treasurer H. B. Pinney, and Chairmen of Committees: Arthur D. Black, George

N. West, Harold S. Smith, John C. Cadmus, Dan U. Cammeron, and many others.

Hats off to the men of Chicago, who have once more shown themselves equal to a great occasion!

\* \* \* \*

The sessions were held in the Congress and Auditorium Hotels, and while important parts of the meeting were the annual clinic and the manufacturers' exhibits, the predominating thought around which the whole meeting centred, was that of Preventive Dentistry.

On Friday night a banquet was given, in the Gold Room of the Congress Hotel, in honor of Thomas Alexander Forsyth, founder of the Forsyth Dental Infirmary for Children, Boston, Mass. During the evening a large model of the Infirmary, a replica of the building in every detail, was unveiled, while the room was darkened and a spot-light shed brilliant light upon the model.

The Toastmaster, Dr. Arthur D. Black, fittingly expressed the feelings of gratitude of the entire Dental Profession to Mr. Forsyth for the magnificent contribution of himself and brothers to the cause of child health, and called upon the following gentlemen to give expression to various phases of the great Oral Hygiene movement as it is being developed in Boston, Rochester and other centres: Dr. Timothy Leary, Boston; Dr. Guy S. Millberry, San Francisco; Mr. Peter Mortonson, Chicago; Dr. Harvey J. Burkhart, Rochester; Dr. A. W. Thornton, Montreal; Dr. H. E. Friesell, Pittsburgh, and Dr. C. N. Johnson, Chicago.

Dr. Johnson made a most forceful appeal on behalf of the children and made particular reference to the assistance already received from one of Chicago's leading citizens, through generous personal contributions, enabling the local authorities to continue the School Dental Clinics. Dr. Johnson expressed the hope that Chicago and other communities throughout the world would catch something of the true spirit of helpfulness as expressed in the Oral Hygiene phase of the Child Health Movement, and go forward in a large way to meet the pressing needs of the situation.

The banquet was a fitting close to a day devoted exclusively to Preventive Dentistry.

\* \* \* \*

In the morning a series of clinics were given, illustrating the work of the Forsyth and Rochester Infirmaries, and the character of service rendered by Hygienists in the Public Schools of Bridgeport.

Mouth hygiene and the correct use of the tooth-brush were illustrated by the Des Moines Clinic Club, who recommended that



the bristles of the brush be pushed between the teeth as though the bristles were a tuft of tooth-picks. The Forsyth tooth-brush technique was the "up and down" motion, while Columbia representatives advocated the circular motion in brushing. All of this was, of course, rather disconcerting to the average practitioner, and demonstrated how utterly "at sea" the Profession is upon the tooth-brush question.

By the way, we believe there are others who teach the oblique motion. What about the elliptic, the parabolic and the triangular motion? The latter might possibly be subdivided into the "equilateral" and the "isosolese." It is surely time that the Profession speak with authority upon this question; otherwise the public oral hygiene campaign will be seriously affected by the confusion arising from so many different methods of brushing being taught throughout the schools of the country.

\* \* \* \*

In the afternoon of "Oral Hygiene Day" a great public gathering was held in the Auditorium Theatre, attended by school teachers, medical and dental practitioners, and the general public, at which Dr. William A. Evans, Health Editor, Chicago Tribune, and Dr. A. C. Fones, Bridgeport, originator of the Hygienist movement, addressed those present. Dr. Fones outlined a new health programme for the schools of Bridgeport, including a provision that no child will be promoted from the Fifth to the Sixth Grade until all remediable physical defects are eliminated. Under this regulation children, before passing into the Sixth Grade, must have all cavities in the teeth filled and present the teeth and gums in a healthy condition. This certainly is a great forward step, and Dr. Fones is to be sincerely congratulated. Here is a case where a Dentist has put his home town on the "health map." Dr. Donald M. Gallie proved himself a most acceptable presiding officer, and briefly sketched some of the more recent developments in Dentistry.

Previous to the public meeting, the Convention members gathered in the Gold Room of the Congress Hotel, where Dr. Wallace Seccombe, Toronto, presented, by means of a series of lantern slides, the important subject of Diet in relation to Oral Hygiene. The dietetic phase of Preventive Dentistry was discussed in a very lucid way, and was greatly appreciated by all as an essential complement to the clinical presentations of the morning session. It was pointed out by the speaker that the tooth-brush is important as a toilet necessity, but that the Dental Profession must study the fundamental causes of dental disease, and correct modern habits of living, if the ravages of dental disease are to be successfully coped with.

Saturday morning was devoted to general clinics covering practically all phases of dental practice.

Thursday was devoted to progressive clinics, some of which were half-day and others whole-day clinics. The full-day clinics were: Casting Process as applied to Clasp and Saddle Construction and Partial Dentures, by Drs. Roach and Dittmar; Full Denture Construction, by Dr. Rupert E. Hall and associates; Jacket and Shoulder Crowns, by Dr. George Thompson and associates; Histology and Pathology of the Peridental Membrane, by Dr. F. B. Noyes and associates; Block Anesthesia in the Practice of Cavity Preparation, Pulp Removal, Oral Surgery and Exodontia, by Dr. Arthur E. Smith and associates.

The half-day progressive clinics included various phases of Prosthetic and Operative Procedures, Root Canal Operations, Pyorrhea and Prophylaxis, Oral Surgery and Extraction Clinic.

Thursday evening was devoted to Chronic Infections and Their Sources, following which an interesting discussion occurred regarding the need for curetment following extraction, in those cases where the alveolar process was infected.

Altogether, the Chicago Convention will go down in Dental History as a *Great Meeting*.

---

54th Annual Convention  
OF THE  
Ontario Dental Convention  
MAY 2ND, 3RD, 4TH AND 5TH.

ESSAYS

PROGRESSIVE CLINICS.

¶ Keep abreast with the trend of thought of modern dental practice.

¶ See demonstrated in the Clinics the later developments in methods of procedure and technique.

¶ *Do not forget* the benefit of mixing with your fellow-practitioners. You get their view-point. If you are lagging you find it out and are inspired to catch up. If you are away in the lead, we need you to bring the other fellow up to date.

C o m e

## The Triumph of Brains Over Brawn

THERE is much to admire in Goliath, the staunch, old-fashioned champion — but the giant was beaten by David, the younger antagonist, who *used more modern methods*.



FREDERICK F. MOLT, D.D.S.  
*Chicago, Ill.*



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, MARCH, 1921

No. 3

## The Elimination of Oral Foci of Infection

FREDERICK F. MOLT, CHICAGO.

THE reluctance of many of the profession to accept any new procedure is perhaps not to be wondered at, but their attitude toward what is termed "surgical removal" of teeth, or "alveolectomy" for want of a more descriptive term, is only repetitive. If the stand-patters had always had their "what-was-good-enough-for-our-fathers-is-good-enough-for-us" way, dentistry as a profession would still be unborn and those in need of dental attention would perforce have recourse to the barber or the blacksmith for the relief of pain. Fortunately ultra-conservatism has not always held sway.

Some few years ago when Rosenow, then in Chicago, announced the results of his studies on focal infection, and elective localization of bacteria, and detailed his animal experimentation, he was greeted by both the medical and dental professions with a great deal of skepticism. Later, when Dr. Mayo made his epochal statement, become trite through constant repetition, that "the next great step in preventive medicine" was to be made by the dentists and challenged us with "will they do it?" we girded our loins and, basking in the sunshine of recognition of our professional importance, determined to show the medical men that we were alive to our responsibilities.

Now, however, the attitude of many of these self-same men is that of a Frankenstein appalled at the monster he has created, and much effort is put forth to discredit this work, bringing out from every nook and corner every sort of statement, no matter by what authority, that will tend in any measure to contradict the aforesaid theories.

Let us grant that the subject of oral focal infection has been taken advantage of by charlatans; that countless sound teeth have been sacrificed through careless, indifferent diagnosis and lack of co-operation between physician and dentist; we must still accept as true the innumerable accredited cases in which patients have been restored to health and happiness by the elimination of diseased oral conditions. No one has as yet offered any rational substitute for Rosenow's theories, and to the list of systemic lesions that have been reproduced in animal passage has now been added the Hunter ulcer of the urinary bladder, the etiology of which has for many years baffled the medical profession.

Assuming, therefore, that these theories are sound, what is the dental aspect? Let us summarize as follows:

1. Oral prophylaxis for the prevention of decay and pyorrhea encroachment is of vital importance. By dissemination of knowledge among the laity, by advancing public school dental service and the propaganda of oral-hygiene, and, more important still, by educating the dentists themselves to a realization that "an ounce of prevention" is worth truly many a "pound of cure," making pedia-dontia (children's dentistry) a much broader field, we shall avoid much of the devitalization of teeth with eventual abscess conditions and their morbid pathological sequelae.

2. Manifest pathogenic oral areas should be *completely* extirpated.

3. Further research must be indulged in and encouraged along these lines with a view to deciding what are at present vexing questions in our profession, such as: Can pulps be devitalized and canals filled in such a manner that no abscess condition can result? Are pulpless teeth non-vital? Are pulpless teeth showing no periapical lesions a source of infection? When is a dead tooth not a dead tooth? etc. At the present time, although we have a large group that term themselves "100 p.c. vitality" practitioners, we have a much larger group that might well be called "100 p.c. non-vitality" for they apparently work on the theory that dead teeth tell no tales; which is true in many cases until the radiogram makes its disclosures.

Here again the effort to discredit has been rife, but in spite of the oft-repeated statement that the X-ray lies, it may safely and definitely be said that the radiogram *properly made* speaks the truth. It is always open to misinterpretation, to be sure, and here is one of the weak places in present-day practice—the willingness of the profession to accept uninterpretable radiograms for interpretations, and the inability or disinclination of many men to read properly those that are well made.

Just as many errors in interpretation are made through mis-

taking anatomical for pathological variations as are made in overlooking pathology in improperly exposed and developed radiograms. The tendency to over-expose, using as much penetration as one would for heavy bone structure is to be deprecated, for in the resultant radiogram there cannot be a sufficient variation in bone detail to bring out pathological deviations from normalcy, unless they are gross.

This undoubtedly accounts for statements frequently made that the percentage of edentulous areas showing radio-lucence presumably pathological, is infinitesimal—the radiograms displayed are usually of such texture that even the trained eye cannot differentiate. Far from being infinitesimal it is, on the contrary, large enough to be a vital argument in favor of thorough curettage, and to explain many of the failures in clearing up systemic lesions by extraction where the operator has removed the teeth and ignored the adjacent infected tissue.

This brings us back to the subject of "surgical removal." The contention is made quite often that any extraction is a surgical operation. Considering the conditions under which a goodly proportion of extractions are done, and the technic employed, this is hardly worthy of discussion. Surgical principles and surgical asepsis are both all too frequently lost sight of, so that in many operations the method of procedure is no whit better surgery than that done in days of yore by the blacksmith, or by the barber, or by the old-time medical practitioner who sharpened his knife on his boot before making an incision.

Nitrous oxid anesthesia has for so many years been considered inseparable from tooth extraction that there is hesitation on the part of many of the profession and of the laity to consider any other anesthetic agent. In consequence, we find operations being attempted under "gas" that manifestly cannot be carried to completion.

Since attention has been called to the advisability of removing granulemata, curettage is indulged in which is, in effect, merely maceration of infected tissue without extirpation, resulting usually in violent reaction, and in only temporary alteration in the systemic conditions, if any.

"Wing-shot" methods in extraction of teeth must therefore be abandoned in most cases of apical involvement if we are to make any pretence of eliminating these foci of infection. Complete and thorough curettage should be done in such a way that direct access to and an open view of the operated area may be had. No excuse may be offered for the frequent perforations of the antrum floor or the uncovering of the inferior dental canal or mental foramen by haphazard extraction and curettage.

In cases, moreover, which present the slightest indication or history of past pathological disturbance, the making of a radiogram should precede the extraction procedure, and if there is disclosed either an extensive peri-apical involvement, or the proximity of such an involvement to some vital structure (antrum, anterior-palatine foramen, inferior dental canal, or mental foramen) our anesthetic agent chosen should permit of the most careful operative procedure.

Nerve-blocking anesthesia is desirable in a majority of limited areas, while in extensive cases ether may be chosen. There need be no hesitation about performing complete edentulations under ether anesthesia, providing the work is done by the open view technic, for with the opportunity presented for thorough extirpation of *all* infected tissue without maceration or trituration there will be no throwing out of infection, and, in consequence, no violent reaction need be anticipated. In fact, the only cases where reaction in any marked degree ensues are those in which old infected areas filled with regenerated bone, still infected, are curetted.

During the last two years I have cultured about 3000 granulomata removed under strict surgical asepsis with the open view procedure and practically no negative reports are shown. The predominating organism, as would be expected, is the streptococcus, mixed in many cases with staphylococcus, diplo-streptococcus, pneumococcus and micrococcus catarrhalis. This also holds true of bone specimens taken from areas radiographically disclosed where remaining pathology has been suspected, and in many of which we have been able to check our diagnosis with old radiograms.

The assumption is justified therefore that since granulomata are themselves infected tissue, and since apparently regenerated bone displacing uncuretted masses retains that infection, only complete extirpation will avoid the pathogenic possibilities, and any method that will achieve this result is good practice. Although in many cases such a window operation may be resorted to as has been used in the now quite-universally abandoned apicoectomy in the major portion of cases retraction of an incised muco-periosteal flap, and the chiselling away of sufficient bucal or labial plate of process will better accomplish the desired result.

In such an operation the incisions should be diagonal, making the flap wider at its base than at the gum margin, both to preserve circulation and to provide in effect a sliding flap. It should be remembered that the shape in which the periosteum is restored will be the eventual result after bone regeneration, so that septa should be retained to act as matrices and suturing should be done where possible over undisturbed bone structure.

The flap should be raised with a periosteotome, using great



care to avoid bruising or tearing, and held back with a retractor or with a tacking suture to the cheek or lip.

With chisel and mallet (not hand chisels, which cannot be self-limiting) the process over-lying a portion of the tooth roots is now removed, the amount taken away varying with the case and being no more extensive than is necessary to obtain direct access and a view of the infected area. The tooth may now readily be tipped from the socket and upon sponging the granuloma will be disclosed.

With a blade (not a spoon) curette, the many attachments which any granuloma has are loosened and the mass practically enucleated and removed intact. In very few cases will any additional curettage be required, for the walls surrounding the granuloma will almost invariably be found dense and hard—a sclerotic bony wall which has evidently been nature's effort to isolate the neoplasm. This wall will usually be encountered as well in curetting necrotic areas in edentulous spaces where it corresponds to the original encapsulation of the granuloma.

Sharp margins or points only, on the lingual plate should be removed unless there is need for aesthetic results, to reduce the ridge. If desired, the operated area may be irrigated with a sterile, isotonic solution, or iodized with 3 1-2 p.c. tincture, after which the blood clot should remain undisturbed.

The retracted flap is now released and if possible carried almost to coaptation with the lingual margin of tissue where it is sutured, not too tightly, and using no more sutures than are necessary to retain it in position. Care should be taken not to cause tension on the flap nor to raise or change the attachment of muscle fibres. This latter point must be scrupulously observed, particularly in complete cases where dentures are to be fitted. Disregard in this matter in an effort to compensate for lack of tissue has brought about criticism of the result.

Strict surgical asepsis should be adhered to throughout the operation.

The after-treatment is simply that indicated following any oral operation. Frequent irrigation with a hot bland solution, cold or hot—wet external applications, and, depending upon the severity and extent of the operative work, medication for the relief of any after pain and for the maintenance of normal elimination.

The fact that such procedure is rapidly being adapted throughout the profession; that local results obtained are so eminently satisfactory; that cases of presumably metastatic involvement show recovery after such complete extirpation of infected masses where simple extraction has been devoid of results; that the preparation of complete mouths in this way is being demanded by many advanced denture-prosthetists, all apparently nullify what criticism there has

been; and the pioneer work of such men as Novitsky, Lucas and Shearer is being broadened and carried out by an increasingly greater group of operators; radicals, if you will, but withal rational radicals. A radical is only one who in any degree ignores precedent.

A man is known by his works. Results count for more than argument, so every operation of this type makes its converts either lay or professional.

---

## Manitoba Dental Association

---

### PRESIDENT'S ADDRESS, 1920.

---

FELLOW members of the Manitoba Dental Association:

Another year has passed and we come together once again to discuss last year's work and to look forward to the work of the future.

A little less than a year ago one of the most popular and generally liked members of our association, Dr. J. M. Parson, was called to the Great Beyond. The late Dr. Parson was a young man of high principle and attainments. I think I can safely say that, in the experience of all who came in contact with him, to know him was to love him.

I attended the meetings of the Dominion Dental Council and the Canadian Dental Associations last year and will report on them at the close of this address.

Last year your Board was instructed to go ahead with the establishment of a Dental College. Committees were formed, but it very soon became patent that in order to commence anything that would be worthy of the name of a college a large sum of money would have to be forthcoming, and it was quite clear to my mind that the raising of a sufficient amount must be, after all, our first duty. The question was where to get funds for this undertaking. It is true that we have a certain amount in our own treasury, but that at best would be only a nucleus of what was required. It was manifestly out of the question to approach the Government for this purpose, as the Government itself was going to the country to be re-elected or not as the case might be.

There remained two other possible sources, that of getting a large subscription from some philanthropic person or raising the necessary amount among the members of our own profession. The first of these has not up to the present been forthcoming; and as for raising it among ourselves, what with the ever-soaring cost of office management and the heavy increase of taxes &c., &c., that method is to my mind also out of the question.

The cost of dental equipment is at present at the highest point it is likely to reach for a generation. In conversation with members of the Board of Governors of the University, I find that the more or less stately halls of learning recently erected are insufficient to accommodate the classes already established.

Allow me to congratulate you on having so efficient a Secretary, and so excellent a Treasurer-Registrar; to be able to present a report at this meeting showing no delinquents, as far as registration is concerned, is a feat any one may well be proud of.

Gentlemen, I thank you.

G. F. BUSH,  
*President.*

#### SECRETARY'S REPORT, 1920.

WITH the ending of 1920 we are entering the era of reconstruction and organization in earnest, following conditions caused by the World War. This is true of Dentistry, as of general business or of social life. Our Association is confronted with various questions, such as the establishment of a Dental College, which will be referred to by our President, and the student question, about which I wish to say a few words.

When the original Act was passed in 1886, or thereabouts, the old apprenticeship system of England was introduced, and for a long time served its purpose well, but times and conditions have changed. With the extension of Dental College Courses to four years, and in some cases to five, it seems unfair to the public, as well as to the student, to allow him to put in four years with his preceptor, during which time he attends two winter sessions at a recognized college as a special student, pass the local examinations and secure a license to practice in Manitoba. The province is pretty well filled up now, and in a year or so there will not be any town of a few hundred or so but will have a resident Dentist, and with the small population in the province he will have quite a struggle to get a decent living. The old plea that the country is not adequately served no longer holds good. Consequently there can be no valid reason for retaining the present apprenticeship system. Certainly a student cannot get a proper education without attending the full College Course of at least four years. The educational requirements should be changed also. The University has changed the requirements for entrance, so that now a student can matriculate without Latin; consequently we should make a change also. No student should get through a Dental Course without at least one year's Latin.

Is there any reason why your Matriculation standard should not be raised to that of the Medical and Engineering professions, both of which require one year in Arts? Right along prospective students

are coming to me, just out of High School, and tell me they wish to article as local students, both because they do not require to put in the extra year at the University that Medicine does, and also because they will not have to put in four years at College. This, gentlemen, is a serious state of affairs.

Regarding details of Association activities, I think I had better give a verbal report as in connection therewith I have a number of letters to read.

C. P. BANNING, *Sec.*

#### REGISTRAR'S REPORT, 1920.

TO the President and Members of Manitoba Dental Association:  
Gentlemen, Fellow-members,—

This is the first year for many years past that a clear, clean record has been presented showing every dentist in our province being duly registered for the year 1920.

All arrears have been collected, and I trust that in future reports will show the same condition.

My report, as treasurer, shows collections from all members, including a debit and credit regarding six C. A. D. C. members.

I thank you, one and all, and look forward to next year's registrar having a pleasant and profitable time collecting and accepting the annual fee for 1921.

I have pleasure in moving the adoption of this report.

H. F. CHRISTIE, *Registrar.*

#### TREASURER'S REPORT TO DECEMBER 31ST, 1920.

##### *Cash Statements.*

Balance at Bank .....	\$1,156.72
Cash in Hand .....	60.00
<i>Receipts During the Year—</i>	
Licenses, and Permits .....	\$1,200.00
Registration Fees—	
164 Members all paid up .....	820.00
1 Member arrear 1919 .....	5.00
6 C. A. D. C. ....	30.00
Interest on Bonds and Bank .....	310.06
Students' Fees .....	130.00
Total Receipts .....	2,495.06
	<hr/>
	\$3,711.78



*Disbursements—*

Secretary's Fee .....	\$150.00
Board Fees .....	190.00
Registration Fees C.A.D.C .....	30.00
Printing and Stationery .....	126.38
Audit Fee, 1919 .....	25.00
Postage, etc. ....	10.60
Travelling Expenses .....	38.45
Law Costs .....	125.00
Treasurer's Salary .....	50.00
Winnipeg Medical Society .....	20.00
Treasurer's Bond .....	5.00

*Investments—*

Farm Loans Bond .....	1,000.00	1,770.43
		<hr/>
		\$1,941.35

*Balance—*

Cash on Hand .....	157.10
Bank Balance .....	1,784.25
	<hr/>
	\$1,941.35

AUDITOR'S STATEMENT, JANUARY 5TH, 1921.

The President and Members of the Manitoba Dental Association,  
Winnipeg, Man.

Gentlemen,—

I beg to report that I have audited your Treasurer's books for the year ending Dec. 31st, 1920, and the statement attached correctly shows the Receipts and Expenditures during the year.

All members are paid to date, and six of the C.A.D.C. only are being carried.

All payments are vouched for.

The Assets belonging to the Association consist of:—

Dom. of Canada 1923 5½ % .....	\$3,000.00
“ “ “ .....	1,500.00
Man. Gov't. Lands Bonds .....	1,000.00
Cash on Hand and Royal Bank .....	1,941.35
Refund Modern Office Supply Co. ....	7.00
	<hr/>
	\$7,448.35

Increase for the year .....	\$1,719.63
-----------------------------	------------

## The Pros and Cons of Fixed Bridge Work\*

A. W. THORNTON, L.D.S., D.D.S., DEAN, DENTAL FACULTY,  
MCGILL UNIVERSITY, MONTREAL.

IF one may judge from the published reports of recent meetings at which the relative merits of fixed and removable bridge work were discussed, the conclusion would inevitably be reached that a state of war still exists; that there is no immediate prospect of a peace treaty being signed; that the millennium is still a long way off, and that if the lion and the lamb are soon to lie down together, one is likely to be inside the other.

Will you permit me, at the very beginning of this paper to say, that I am not a "dyed in the wool" partisan of either group, while at the same time I have some opinions, fairly well grounded, and I believe, founded on a somewhat extensive opportunity for observation. As you are all aware, one of the world's great medical men, Sir William Osler, died at Oxford a few months ago. He was, without doubt, the most famous graduate of McGill University's Medical School. Not only in Canada but in the United States, in Great Britain, in every civilized country in the world, his claim to greatness as a medical man and teacher is fully recognized.

On what foundation does that recognition of greatness most fully rest? On any great discovery, such as those credited to Lister, Koch or Pasteur? No. On any marvellous advance in surgical technic? No. Sir Wm. Osler was great because of his passion for truth, and the eternal principles of which truth is always the bed rock foundation. Every paper mentioning his death, spoke of his "wonderful power of diagnosis." Just what does that mean? This: that he sought the "cause" before attempting to treat the consequences. From one of the newspaper references to his life work, let me quote a single paragraph:

"SOLIDARITY OF MEDICINE."

"Of no other profession is the word 'universal' applicable in the same sense. The celebrated phrase used of the Catholic Church is in truth much more appropriate when applied to Medicine. It is not the prevalence of disease or the existence everywhere of special groups of men to treat it that betokens this solidarity, but it is the identity throughout the civilized world of our ambitions, our methods and our work. To wrest from nature the secrets which have perplexed philosophers in all ages, to track to their sources the cause of disease, to correlate the vast stores of knowledge, that they may be quickly available, for the prevention and cure of disease—these

\*Paper read before Canadian Dental Association, Montreal, August, 1920.

are our ambitions. To carefully observe the phenomena of life in all its phases, normal and perverted, to make perfect that most difficult of all arts, the art of observation, to call to aid the science of experimentation, to cultivate the reasoning faculty, so as to be able to know the true from the false—these are our methods. To prevent disease, to relieve suffering and to heal the sick—this is our work. The profession in truth is a sort of guild or brotherhood, any member of which can take up his calling in any part of the world and find brethren whose language and methods and whose aims and ways are identical with his own."

If this be true of Medicine, is it not equally true of Dentistry? There is no one method of treatment, no one method of restoration that in all cases, and under all circumstances is always right, and all other methods always wrong. But there is, there must be for every individual case, a best method, when all the circumstances are considered, and it is your business and my business to find out the truth about that method and, having found the truth, base the treatment or restoration on that knowledge.

Will you permit me to quote one sentence, not perhaps relevant to the subject under discussion, but which shows the enlarged vision of a great man, and suggests a line of action which the dentists of this continent might profitably lay to heart:

Sir Wm. Osler says:

"My feeling on the subject of international, intercolonial, and interprovincial registration is this—a man who presents evidence of proper training, who is a registered practitioner in his own country and who brings credentials of good standing at the time of departure, should be welcomed as a brother, treated as such in any country, and registered upon payment of the usual fee."

This paper, which I am about to read, owes its inception to a letter received by me (it was a circular letter sent to the teachers of crown and bridge work) from Dr. Ottolengui, the letter itself founded on an article or series of articles appearing in the "Items of Interest." Shortly after the receipt of this circular letter, I received an invitation to appear before your Society, and this accounts for my presence here this evening.

Replying to Dr. Ottolengui's letter I said: "You have certainly opened up a very large question, a question, however, which must find a solution, if Dentistry is to occupy the place to which it is entitled in the professional life of the world."

After seven years of exclusive hospital practice, in which not less than one thousand cases a month are seen, there is absolutely no doubt in my mind that much of the bridge work, as practised in this country, is constantly associated with, and frequently the cause of serious septic conditions.

For the second paragraph there cannot be the same unqualified endorsement. The question is asked: "Were it to be found that a certain surgical technic resulted in a mortality of eighty or ninety per cent., do you believe that reputable medical schools would continue to advocate such operations?"

Let me answer that question by asking another: "What would be the mortality in major or even minor operations if all graduates in medicine were to attempt surgery?" Is it not true that the vast majority of medical graduates never attempt even the most simple operations in surgery? Tens of thousands of medical men never attempt the surgical removal of an appendix, much less an operation for sarcoma or carcinoma, the removal of a kidney, the opening of the gall bladder, surgical treatment for duodenal ulcer, the removal of an eye, surgical treatment for mastoid disease, and most of these thousands would stand aghast at the suggestion of an operation on any part of the brain or surgical interference with the more important glands of the body. And yet, many of the surgical operations successfully performed every day in the year, are the veriest child's play when compared to some of the things which a dentist is called upon to do in the routine of ordinary practice. Still, all medical schools teach surgery of every possible nature. Why? For two reasons principally: First, as a foundation on which a student may build to become a specialist, and second, because "the masses" under existing conditions, cannot procure the services of specialists.

In the third paragraph of the article referred to, the question is asked, "Is it that bridgework itself is wrong in principle?" My answer to that question is, "No." But there are places where bridge work of *any kind* is contra-indicated, and in all cases there are difficulties to be overcome, properly to cope with which requires a very high standard of ability. The mere mention of some of these difficulties will suffice: e.g., proper preparation of the abutment teeth; the physical strain on both patient and operator; the destruction of serviceable tooth tissue; the proper preparatory root canal treatment, when such is necessary; the unavoidable wounding of adjacent tissues: all of these and many others will immediately suggest themselves to any man who has ever attempted any kind of bridge work.

The third paragraph is certainly full of "food for thought." "Where lies the responsibility?" This is a question very difficult to answer. Much of the difficulty lies primarily in man's innate cupidity. *Patients* think that the "gold" in a bridge in some way makes the most desirable restoration and being "gold" must of necessity be "expensive." Many dentists deliberately foster this idea in order to trade on the ignorance and credulity of their patients. Not lack of "skill" but lack of common honesty is accountable for



many of the most abominable and disastrous attempts at so called "bridge work."

But there is another side. To properly fit a bridge of any kind in a patient's mouth is an exceedingly difficult task; in many instances so difficult that few if any dentists possess the necessary skill, and few if any patients possess the necessary degree of endurance, to permit the operator to put such skill into practice.

The next question is a poser: "Does not the remedy lie in removing this from the sphere of general practice because of the incompetency of the average dentist, and erecting it into a specialty to be conducted only by men who have elaborated their skill by thorough post graduate teaching?"

The question arises, "When should this post graduate teaching be done?" Should it follow immediately upon graduation or should a man spend some years in general practice before taking the proposed post graduate work? My own opinion is that every man should do general practice work for some years after graduation, before entering upon the work of any specialty. Many reasons might be assigned for the position. Specializing is very apt to produce a narrowness of vision. The man who has done nothing but "specialize" lacks the broad general knowledge which comes only to the man who has done a little of everything.

The specialist who knows his specialty is the one who has come up "out of the great tribulation" of general practice, but the man who is and has been always, only a specialist, is apt to be just a trifle conceited and apt also to divide his confreres into two groups, 1st, the aristocratic class of specialist and 2nd, the great mass of unwashed general practitioners. The cure for this abnormal cerebration is an injection of serum, prepared from a culture of five years of general practice.

How are specialists made in medicine, in law, in any professional calling? Is it not from men who have taken a general course and done general practice first? Is a specialist more *honest* than the "average dentist?" Where will the teachers come from who will conduct this post graduate work? Who will determine the nature of the teaching? What form of removable bridge work at the present time is "safe and sane"? Where will the men come from to take post graduate work, if the teaching of bridge work be eliminated from the present curricula?

Think just for one moment of the result of abolishing the teaching of crown and bridge work from the general course in all our colleges. What would be the mental attitude of the student body to any subject of which he hears nothing in his four years of training? Would it not be something along this line, "Well, this subject cannot be of much importance or we would hear something of it

during our course at college." Or, if a student hears nothing of the subject and learns nothing of his technique, and makes no attempt to do any of it, and sees nothing of such work in the mouths of the patients, if he learns nothing of the trials and difficulties, nothing of the evils attending badly performed operations, or sees nothing of the advantages of such work well done, nothing of the splendid service which well made bridge work is capable of rendering, how or why or where will the future bridge workers (specialists or general practitioners) receive their inspiration or be convinced of the necessity or advantage of special training for this particular line of work?

No. As I see the truth, bridge work is a legitimate part of the ordinary practice of dentistry, and the schools, instead of abandoning the teaching of crown and bridge work, must teach it more intensively, strive in this as in all our work, to inculcate not only better technic but higher morals and above all, must emphasize the irreparable injury which a patient may suffer as the result of faulty or imperfect crowns and bridges, and at the same time, teach every graduate that leaves our schools, that such operations lower not only his own standing, but the standing of the whole profession, a profession, which at the present time, is recognized as a most important factor in the health and general well-being of the general public.

What would be the effect of limiting any class of operation to those who have taken post graduate courses? Would it not inevitably be to limit the supply of such "specialists" and in consequence, limit the service of such specialists to the wealthy few, and what guarantee would any patient have that *honest* services were being rendered? Have you any idea that the teachers of post graduate courses would inculcate a higher standard of morals than the teachers now on the faculties of our schools? Personally, I have no such idea.

In regard to examiners demanding "bridge work," "practical and theoretical," for examination, some change, I am convinced, is necessary. I suggested to the examiners in the Province of Quebec that "any form of restoration showing average judgment and skill in execution, should be accepted," but as yet the suggestion has not been adopted. But examiners are appointed by "law" and there may still be some truth in the well-known statement, "the law is a *hass*."

In regard to the pathological sequences of fixed and removable bridge work, well—the great difficulty is not at that point. The man who cannot or will not prepare an abutment, or fill a root canal or make a crown that "fits" for a fixed bridge, will not prepare a cavity or fill a root or make an inlay or carry out the delicate technic necessary for a removable bridge. No. The solution of the prob-

lem, the importance of which cannot be over-estimated, has not, I think, been suggested in your circular letter. Ordinary men, with ordinary mechanical ability (many of them lacking ordinary honesty) are attempting to do a very extraordinary thing for patients of not more than ordinary intelligence, ordinary endurance or ordinary appreciation. The result must always be a great percentage of "failures."

I do not wish to arraign the morals of the dental profession as a whole. I know them too well for that. I am too rich in the friendships of my professional confreres; as clean, as honest, as high minded, as any class in the world. But unfortunately (or perhaps fortunately), dentistry lacks the age-long traditions of law and medicine, and it is of comparatively recent date that the close connection between dentistry and the public health has given to the profession that importance which has secured for it recognition as one of the learned professions.

It is true nevertheless, that we have in our ranks all too many of that class who see only the mechanical part and who are willing to take advantage of recent professional and scientific advances to commercialize a calling designed, as few callings in life are designed, to add to the health and comfort of practically the entire human race.

But every profession has its quota of dishonest men. Medicine has its quacks and abortionists, law has its shysters, the clergy has its hypocrites, "C. A.'s" (chartered accountants) have men whose business is to "cover assets" in order to defraud the government out of legitimate taxes.

But one thing surely can be done. Let us "carry on" in our schools, trying to send out men who will recognize that patients come to them for advice and service, that such patients are at the mercy of those to whom they apply for treatment and that faithful, honest service should be the watchword of every right thinking man.

In paragraph 5 of the circular letter, mention is made of a "removable bridge so constructed that no use of the bridge itself adds to the stress upon the remaining natural organs." In the ordinary acceptance of the words "bridge" and "abutment," I cannot see how such a thing is possible. Surely in every bridge the abutments carry not only the weight of the superstructure, but in addition, the weight of any "load" that may be placed on such superstructure. If that is not a fundamental principle in engineering, then I have mistaken the meaning of some very ordinary English words.

In the same paragraph the statement is made "if those abutments should become diseased, they are in the same category as a filled tooth which should become diseased, and the cause of the disease is not the bridge itself."



The questions naturally arise at this point,

(1) "What diseased conditions do we usually find in these abutment-teeth and what causes these conditions?"

To answer the first question "What diseased conditions do we usually find in these abutment teeth?" let me say in general terms, inflammation of gum tissue surrounding the teeth.

(2) Inflammation of the peri-cementum and (3) inflammation of the nerve tissue or pulp within the tooth." In all of these tissues we have the usual symptoms, redness, swelling, pain, loss of function, suppuration.

There is a phase of this question being continually raised, which I think does not enter the discussion at all and should not be dragged in as a matter of primary importance. We hear from men, apparently thoughtful, such expressions as the following, "Oh, I've seen removable bridges which were just as filthy and dirty as any fixed bridge work," or "I have even seen partial dentures which were as filthy as any type of bridge could possibly be." All are agreed on the facts so stated, but such statements are all foreign to the question. Any kind of denture, full or partial, any kind of removable bridge, may be so neglected as to become filthy, to any conceivable degree, but the construction is in no way responsible for the filthy condition nor for any pathological conditions that might arise as a consequence of the filth. But in a case of fixed bridge work the very construction itself and the fact that it is fixed renders cleanliness impossible by any ordinary toilet means, and in addition, fixed bridge work as we see it in the vast majority of cases, is directly responsible for the local pathological conditions and systemic infections, so varied in character and so appalling in extent, that no man in ordinary dental practice can form any adequate conception of the gravity of the situation.

There is a phase of this question which I know many of you are anxious to hear about. I have no doubt many of you have heard the expression "Teeth move in function." Without wearying you with detail or lengthy discussion, let me say that the claim has been made that because two or more natural teeth, used as abutments for a fixed bridge have become spontaneously non-vital, and in consequence have become foci of infection, that this non-vital condition is due to lack of movement of the several teeth, and that this lack of movement is due to a rigid appliance, fixed to the several teeth. Now, I am willing to admit that a great many vital teeth have become non-vital when used as abutments for fixed bridges, and that serious systemic effects have followed this traumatic devitalization

But I am not sure that the devitalization of these teeth is due to lack of movement, which in turn is due to the fixity of the entire



appliance. I think I am safe in saying that in the past six years, we have removed hundreds of pieces of fixed bridge work from the mouths of hospital patients. When I tell you that at one time (I mean at the same identical moment) we had in our examining room, four women, in whose four mouths there were forty-seven gold crowns, you will acknowledge that we have the experience upon which to base tolerably authentic conclusions.

As our clinic is an integral part of a large hospital, and as we are not far from the international line, we see patients not only from our own city but from many parts of the cities and states of the Union as well. The nature of the work does not differ in different localities. In the vast majority of such cases we have found apical abscesses in many, many cases. When the bridges and gold crowns were removed, we found teeth without cavities, and of course unfilled nerve canals. Even in teeth with large cavities, we have found a great many where no attempt has been made to fill root canals. Because of these conditions, we came to the conclusion that the crowns had been adapted to vital teeth and these teeth had become non-vital. Why? In my opinion there is not the shadow of a doubt that the cause of the devitalization of these teeth, had its inception at the gingival margin, and that the inflammatory process which finally resulted in the death of the tooth, was caused primarily by an ill-fitting crown, wounding, lacerating the thin gingival margins with their one or two layers of epithelial cells.

Because of the work which has been done by Box of Toronto, Noyes of Chicago and others, we know that the blood supply of the pericementum runs parallel to the long axis of the tooth, that lymphatics accompany these blood vessels, and that the infection begun at the gingival margin soon finds its way to the apex, causing the death of the pericementum and the periapical tissues.

But we have found the same condition exactly in single teeth, bicuspsids, molars, centrals, laterals, cuspsids, where an ill-fitting gold crown produced first an inflamed gingival margin and finally an intensely inflamed area extending, in nearly every instance, to the apex.

Not loss of motion but infection made possible by the breaking down of the defence area, the gingival margin, in the single tooth as well as in the tooth used as an abutment for a bridge, is the answer to the question "Why are so many crowns constantly associated with and frequently the cause of serious septic conditions?"

A somewhat new phase was given to this question, following a discussion of the subject in this city a short time ago. I refer to the introduction of the cement question and the connection of the cementing medium to gingival irritation and infection.

I think that it was unfortunate that, without directly stating the

fact, the impression was left that in a crown embodying the full band principle, a cementing medium of a certain nature would in some way atone wholly or in part for faulty adaptation.

It is hard also to understand a sentence of this nature: "All three types of the gold crown mentioned, have the objection that they have the band around the root, which when properly fitted, made as thin as possible and retained with a good antiseptic cement, while not very hard on some teeth, is quite so on others." Compare that statement with the following from the same source—the statement occurs while referring to open faced crowns—"Later observations led us to believe that neither of these crowns irritated the gingiva *very much*" in many cases, if the partial or full crown properly fitted the root, and more recent observations have caused us to add, "if the cement is a modern one."

It is a truism, is it not, that "like causes produce like results"? If so, then how is it possible for a certain type of operation to be "not very hard" on some teeth, but "quite so" on others? Then take the other statement, viz: "neither of these crowns irritated the gingiva *very much*."

I can scarcely think that the author of the statement has been correctly quoted. If the quotation be correct then I wish to say that the "muchness" of the irritation is always in direct ratio to the imperfection of the adaptation of the band, and no kind of cement (of which we have any knowledge) will prevent serious irritation, with all its attendant evils. Permit me to quote another sentence emanating from the same source—"I am convinced more and more firmly that a removable bridge is uncalled for, and may be much more unsanitary for the twenty-three hours and thirty minutes of the day that it is in the mouth, than a good fixed one is when retained with a good copper cement."

You will notice that the adjective "good" is made to qualify only the "fixed" bridge. But, apart from that, how is it humanly possible for a removable bridge to accumulate more filth in a given time than a fixed bridge, for the same time? What is there in the construction or adaptation of a removable appliance that will bring this about. The writer suggests in the sentence that at least once a day, a removable appliance may be removed and made clean. Then is it reasonable to suppose that an appliance which may be made clean at least once a day, can by any possible means be more filthy (other things being equal), than a fixed appliance that can never be made clean? As well tell me that a man who bathes once a day (other things being equal), will be as dirty as a man who never takes a bath.

#### THEN WHY USE THEM?

Let me make this statement and make it absolutely without

reservation, "I have removed scores and scores of fixed bridges from the mouths of hospital patients and I have never removed one such that was not filthy in the extreme, and in many of these cases, the other teeth were clean and showed every evidence of successful toilet attention."

Permit me to read another sentence from the article to which reference has already been made, with which I am in perfect accord, viz: "So long as there are variations in ideals and ability it is useless to urge the profession to the use of one kind of bridge work or to expect various kinds to be executed with the same degree of perfection."

There can be no adverse criticism of that sentence. It would be useless to expect to make a great painter out of a man who is color blind or a musician from a person who cannot distinguish between harmony and discord. So it is quite impossible to teach a man, lacking altogether in mechanical ability, to do a thing so difficult as inserting a mechanical appliance, the requirements of which are so varied and so difficult as the work which we are discussing.

I have been attempting to teach bridge work for some years, and I confess that I am not proud of the effort if I am to judge from much of the work which I see. But, I have tried to formulate certain principles and these seem to have followed a natural process of evolution.

My first well-established principle given to my students was this — "In all your crown and bridge work strive for 'accuracy of adaptation'." But this was not enough, and I soon added this: "*continuity of outline*." After some time, this third precept was added, "conservation of serviceable tooth tissue" and lately I have added the fourth, "harmony with environment."

I try to teach students a technic that will enable them to fulfil these principles, but I am conscious all the time that "to some He gave one talent, to some two, to some five," convinced too that in the great majority of cases it is the man with the five talents that trades and makes other five while he who has only the one or two, is content to hide his in a napkin: and the result of this lack of ability or desire for improvement is seen in the aesthetic and anatomical monstrosities that are an offence to the eye and a menace to the health of the unfortunate persons who are the victims either of ignorance or cupidity.

#### DISCUSSION OF DR. THORNTON'S PAPER.

**D**R. E. C. JONES (New Westminster): Mr. President and Fellow Practitioners: I have been casting around in my brain to find out why your Committee should have asked me to open the discussion on this paper. It is the last paper of the session, and this will be the last discussion of the session. We are all very tired, and the Committee evidently thought that as I had travelled some three thousand miles to get



here I would be so tired that I would shut up quickly. In fact, on my way to the platform one of the boys said to me as I was passing: "For heaven's sake, be brief."

It affords me some pleasure to make a few remarks on a paper of this kind, particularly so because—I was about to say that I was associated with Dr. Thornton at one time. Fifteen years ago I was associated with him in this way: he was the professor in crown and bridge work at the Royal College and drew the salary; I was a demonstrator to assist him and did the work. But I say in all earnestness, gentlemen, that I learned more during that year of association with Dr. Thornton about crown and bridge work, and it has done me more good, than all I have learned since, and I think I have learned a lot since.

However, I cannot agree with all he has said in his paper. I cannot take quite so optimistic a view as he does of modern dentistry, or so-called modern dentistry, as we have been practising it during the last fifteen or twenty years. In fact, I am almost as pessimistic as Dr. Ottolengui with regard to some of the bridge-work that we see in mouths to-day. Dr. Ottolengui has made the statement that most modern crown and bridge work is septic dentistry. I am sorry to say I think it is true. I was a little disappointed that Dr. Thornton was not more specific in regard to what he considered was good practice; we are anxious to learn the result of his findings as to what class of crown and bridgework he thinks at this stage is good to use. I remember that at college he was quite specific about some things. I remember that when he was teaching the making of gold shell crowns he told us never to devitalize if it was possible to avoid it; and I am thankful he told us that, in spite of the fact that other authorities advocated devitalizing in every case. He was quite specific when he spent a day in teaching us how to make a seamless crown by the outside-inside method, and then spent another half-day teaching us to do it by the inside-outside method; then he said: "Gentlemen, I have told you how to make them, but none of them are any damn good!"

DR. ABBOTT: I rise to remark that Dr. Thornton never made use of the word "damn."

DR. JONES: That is the western way of expressing what he said. I shall be more specific than he was, and say I believe that the manufacture and placing of gold crowns on the teeth of patients during the last fifteen years has done more harm than good to the health of humanity,—that is, taking into consideration those that were put on by the charlatans and the quacks—and all the quacks have not been in the advertising class, either. I think that more harm has been done than good; it would be better if the gold crown had never been invented. I hate to say that, but I believe it is true. I do not say that a gold crown has not its place in dentistry; I believe it has. I make them myself,—not very often, but occasionally I do, and I think they have a place; but as they have been made, I think they have practically no place.

I do not think it is good practice to devitalize a sound tooth, under practically any condition, in order to make it an abutment for a bridge. I hope there are none of you who do that now. Some years ago I did it myself, but in the light of our present knowledge of focal infection, I do not believe that it is good practice. Further, I think it is never wise to mutilate a sound tooth to insert an inlay or crown as an abutment for the bridge, even if you do not devitalize it. I believe there are many removable appliances that can be used to advantage. I have in some cases used that taught by Dr. Roach,—the catch-clasp. Or there are the more complex appliances, to be used where you have already filling in the teeth,—some of the attachments as invented by Dr. Roach or Dr. Morgan or Dr. Chase. If you have the ability to make these appliances, they are good, but never mutilate a sound tooth in order to make use of them.

I think that the fixed bridge has a small place in dentistry. I make



a few of them. I would like to have heard Dr. Thornton's opinion of the fixed bridge,—whether it has any place in dentistry. I think it has, in short spans and if you use, possibly, a three-quarter gold crown—a modification of the Carmichael, which does not require devitalization of the tooth. But these things must be carefully made if used at all.

In closing, I do not think I can do better than cite a few remarks of the essayist, with which I wholly agree: Bridgework is a legitimate part of dentistry, but the schools must teach it more intensively and emphasize the irreparable injury which a patient may suffer as a result of faulty and imperfect crowns and bridges. I thank you, gentlemen.

DR. NOLIN: Mr. Chairman, dentistry seems to be going round in vicious circles. Some forty years ago, the National Association excluded from its membership a certain number of distinguished practitioners of New York and other places because they filled teeth with amalgam. The use of amalgam filling was declared by the most eminent men in America, leaders in the National Association at that time, to be unprofessional, and was condemned outright. In the light of what we know to-day about amalgam, we smile when we recall the attitude of the men of that day. If you read the old authors on bridge work, you will find from the very start that to which we are coming back, that is to say, perfect fitting crowns at the neck of the teeth,—something we seem to have forgotten since demountable bridges were taught.

The teacher of bridge work, as Dr. Thornton implies in his paper, is at a loss what to do or what to say. He may teach the principles of bridge work as carefully as he can, but in a class of thirty there may be a large number of young men who, as soon as they go into practice, will do their bridge work in an entirely different way. Should we condemn outright fixed bridge work? When we look at the abominations that come to us in hundreds of mouths, we almost feel that we should. However, we do know of numerous cases where bridge work has given good service,—where it has, perhaps, restored the functions of mastication and thus saved life. So we are still in a dilemma. Is the removable bridge the solution? Is the substituting of partial plates the solution? Still the point of interrogation remains. A few years before the war, Dr. Lejedorez had been studying and practising a method of bridge work which, to my mind, may be a solution of the problem which we face. In a paper which I read in Toronto a year or two before the war, I gave a very short and, to my mind, unsatisfactory, exposition of that eminent gentleman's work, in connection with which I showed a few models that I had made. I have tried his system in the mouths of a number of patients, and the results have been rather satisfactory. It is a system of bridge work in which a cast band, somewhat similar to the band we make for orthodontia, goes slightly over the masticating surfaces, but not quite down to the gums. A band is made with wax; a kind of elongation on the side of the bridge is made; the wax is split open and passed over the tooth,—which has not been ground, not a bit of enamel removed. That band is cast and replaced over the tooth. The contraction of the gold has caused the opening to remain slightly open; this is pressed back into place, giving as perfect an adaptation as anything will give to the surface of the tooth. Then a cast bridge to fit over this is made. The bands are then screwed into place and the bridge is fixed to these abutments with pins that go through, leaving to the bridge a certain motion,—and we have a bridge that can be taken out of the mouth, cleaned up, and replaced in the mouth in half an hour's time. When the war broke out, I do not know what became of Dr. Lejedorez; I believe that he took up war work, and I have not heard anything about him since. His work has not been given publicity, but it should. This is a line of thought which it would be to the advantage of the profession to work upon in future years.

I congratulate Dr. Thornton on his very interesting paper. We know

that Dr. Thornton never addresses any gathering without those present feeling the better for it and appreciating the privilege of hearing him.

Dr. FLEMING: I am sure that we all listened to Dr. Thornton's paper with a great deal of interest. We always expect a treat when he appears on a convention platform, and we are never disappointed.

There are some statements in Dr. Thornton's paper, however, with which I cannot agree. You know, there is a little bit of Scotch in my make-up,—Scotch blood, I mean; that is the only kind of Scotch I have. They say a Scotchman always goes in backward; so I am going to start near the end of Dr. Thornton's paper and offer a criticism first.

He spoke of the man with the five talents, the man with two talents, and the man with one talent. He always quotes scripture when he gets up to give a paper. On this occasion, however, he wishes to improve on the words of the good Master; he talks about wrapping the two talents and the one talent in a napkin, whereas the Master said to the man with the two talents: "Well done, thou good and faithful servant," the same as He said to the man with the five. We have not all got five talents. We have not all attained the distinction in the profession that Dr. Thornton has attained. Some of us have not attained distinction of any kind; we have not even become distinguished failures.

Fixed bridge work is something that is very much abused to-day, and it is not so much the fault of fixed bridge work as it is the fault of the operator. Dr. Thornton speaks of conscientious work. If we do fixed bridge work conscientiously, we shall probably do a great deal less of it, and the general standard of the work will be higher; but we shall not have to abandon it altogether.

It is unfortunate that a great many dentists—as is the case with other professional men—are in the business simply for the money that they can get out of it. Gold crowns are clapped on for the sake of the dollars and cents; so long as they will slide over the tooth, it apparently does not make any difference to some men whether those crowns fit or do not fit. Yet there is money in it; therefore they do it. Just here I might quote something I heard in Toronto,—where they always do good work. Dr. Thornton knows that; he lived in Toronto for a time.

Dr. THORNTON: Sure.

Dr. FLEMING: I have been practising dentistry for twenty-five years or more. When I was a freshman at college, I had the honor of being taken, under the wing of Dr. Frank Adams, of Toronto, to a meeting of dentists in that city. As a student, I had no business to attend that meeting, but, as I say, I got in under his care. Gold crowns were then not as commonly made as they have been since; in fact, I think there were some dentists in Ontario in those days who had never made a gold crown. However, these men had learned to make gold crowns, and at that meeting a dentist, prominently spoken of in Toronto as one of the good dentists of that city, made the statement that you could save almost anything in the form of a root now with gold crowns; that in cases where the top of a lower first molar was gone you could fill the roots and push a gold crown over them, with satisfactory results. Now, speaking of extremes of opinion, some men will grab the pendulum, swing with it as far as it will go; then they jump after that. Men who hold such extreme views are bound to come to grief. Some five years ago, at a meeting of the Ontario Dental Association, I heard that man—the same man who was going to put gold crowns on everything—make the statement—not in public, but before a group of men—that the man who would put gold crowns on teeth should be regarded as guilty of malpractice and that his license for the practise of dentistry should be cancelled. There was the case of one man who said at one time: "Put on everything," and who said some years afterwards: "Put on nothing." On the first occasion he swung with the pendulum one way as far as he could get; the next time he swung the other way to the other extreme,—he forgot the Pleasant Valley of Common Sense in between.

Now, if we put gold crowns or fixed bridges on for our patients only as we would have them put on for ourselves, there would be many more better fitting bridges and more bridges that can be kept clean. All fixed bridges are not necessarily dirty, with all due deference to Dr. Thornton's statement. I think that the dirtiness of fixed bridges rests not so much with the bridge itself as it does with the operator who has made it and put it on and with the patient who wears it. As to the cause of diseased conditions in abutment teeth, I understood Dr. Thornton to say that it was the dirty condition around the neck of the tooth. Was I right in that?

Dr. THORNTON: No; it was the inflammation having its inception at the gingival margin.

Dr. FLEMING: A bad-fitting gold crown would cause that inflammation,—the pushing of the gold crown down under the margin of the gum, the crown being too large and not properly fitting the tooth.

Now, I do not wish to hold myself up as being better than anybody else in the matter of crown and bridge work; I am only one of the small "toads in the puddle." But if Dr. Thornton ever happens to be in my town, I think I can show him two fixed bridges that were put on twenty-three years ago, both in one mouth—and, by the way, each of them is attached with an open-face crown to a cuspid and a full gold crown to a second molar—and he will find that those bridges are just as clean as the average removable bridge. The bridge is made in such a way that the patient has a chance to keep it clean, and she does keep it clean. I do not think, therefore, that all fixed bridges can justly be condemned as filthy or as bad fixtures, provided they are properly made and properly fitted and the whole of the work is done conscientiously.

Dr. THORNTON: With regard to the patient mentioned by Dr. Fleming in the latter part of his remarks, it may be true that there is an isolated case of that kind here and there. Since coming here, I met a lady whose hospitality I had the pleasure of enjoying a few years ago. Talking of this lady, a friend of mine said: "She is the cleanest woman I ever saw; her house is the cleanest you could find." Now, there are persons like that who are scrupulously clean, and the case mentioned by Dr. Fleming may be one of that class. I do not know how you would make a fixed bridge if it was for the posterior part of the mouth. What we call sanitary bridges, which do not touch the alveolar crest, may be made so that a piece of rag may be drawn from one side to the other and the cap polished in that way. But certainly, fixed bridges as they are made and as we see them in the mouths of patients are not cleanly, and I think the general consensus of opinion will endorse that position.

Now, Dr. Nolin said during the course of his remarks that there were cases in which a fixed bridge possibly saved a man's life. I cannot conceive of any such case as that. I wish it had been possible for you to see two removable bridges which were in the mouth of one of the members who was in attendance at this Convention, but who had to go home last night. He had lost a lower molar on each side—a first molar or second molar on each side. Which one of you would have the tooth anterior and posterior to the vacant space ground down in order to supply that one tooth? Yet this man is one of the most scientific men in the country. He realized that his teeth were drifting a little and producing traumatic occlusion, so he constructed for himself two removable bridges along the line of the technique suggested by Dr. Nesbitt of Boston. I said to him within the last seven days: "How long did it take you to become accustomed to them—until they were comfortable?" He said: "They were comfortable from the time I first put them in; I am not conscious that they are there; I bite on them as comfortably as possible." Now, is that not better practice—to put in removable pieces that can be taken out and cleaned, without the destruction of any serviceable tooth tissue? Is that not better than putting in the best kind of fixed bridge work? I believe it is. If you have a missing lateral in the anterior part of the



mouth, and you can make one of those half crowns, casting it with a shoulder somewhat along the line of the Carmichael attachment, I believe that a fixed piece can be kept clean there because there is no occlusal surface involved. But in the posterior part of the mouth I say it is next to impossible to do that. I cannot conceive of a place where it would not be better to put in a removable bridge than a fixed bridge. Let me say that we owe this to the inception of bridge work: that it has brought about a perfection of technique which, perhaps, we should never have had but for the advent of fixed bridge work. It brought with it another advantage: that men in the dental profession commenced to get a fee commensurate with the service which they rendered. The time has now come when the members of the profession can get just as good a fee and adopt a better plan of practice. The public to-day recognize the fact that dentistry is necessary and that it should be paid for. At first, bridge work commanded a high fee because so few men were doing it; and the size of the fee made the wealthy people think that they were getting superior service.

Most of you know Dr. Arthur Black; he is not a man who could be easily imposed upon. Three years ago, I was attending a meeting in Pittsburg. In company with Dr. Black, I was walking to the institute where they do the research work. He opened his mouth and said: "How do you like my bridge?" I could not see any bridge, but he had one in his mouth. This was its history: Both upper centrals had become devitalized through apical abscesses. His father treated them; one yielded to treatment, but the other did not. Other men gave him treatment, but still the abscess did not heal. Finally the tooth was extracted; and he put a bar of gold on the lingual side and attached it to the other devitalized tooth so that he had his own tooth as a bridge. "For years," he said, "I have had in the sole of my foot a little boil. Pus would accumulate there; I would open it, and it would give me no more discomfort for a time; then perhaps in three or four weeks it would come again. That has been going on for years, but since I have had this tooth extracted and the socket curetted, this trouble has disappeared." A few months ago, I was at a meeting of the Pennsylvania Society in Pittsburg, and Black was there. I said: "How about your bridge and how about the boil in the sole of your foot?" He said: "I had one recurrence of it about three weeks afterwards, and I have never been troubled with it since." Now, he is not a quack; he is a man who is able to draw a fairly logical conclusion.

I do not take the position that I do because I am a better operator than anyone else. Someone has referred to standing or distinction or something of that kind. Well, let there be no more of that so far as I am concerned, for I am one of the very humblest of men. But I have had a chance to observe the results following from mouth infection. I have seen deaths occur from this cause. I have seen scores of people who were crippled; and I have seen many of these restored to health by the extraction of teeth and the curetting of sockets. I know what I am talking about when I say that it is one of the hardest things any man can undertake in the mechanical line to make a crown that will fit under the free margin of the gum. If you make such crowns at all, do not let them touch the free margin of the gum.

If you give this matter serious thought, you will come to the conclusion that there is no case in which you cannot do yourself and your patient better justice by putting in removable appliances—and not, by the way, one of Shea's appliances; for it requires the destruction of too much tissue; it is complicated, and when it breaks it is hard to repair. I have been in Shea's place many times; I know him very well.

You talk about the man who five years ago said one thing and to-day says another. Well, is that not as it should be? Surely a man should not stagnate. Up in Ontario, where everything is right, a judge was



trying a case. He committed it to the jury, and after three hours the jury returned and the judge said: "Are you agreed on a verdict?" The foreman said: "No, my lord, we are not." Said the judge: "Is there any possibility of agreement?" The foreman replied: "I do not know; we stand eleven to one." The judge said: "Well, I am going to send you back. I have no right to dictate to you what your finding shall be in this case, but I want to direct the attention of the one man to the fact that a wise man may change his opinion, but that a fool never does." In the light of our present knowledge, with the information that we get through the use of X-rays; with what we know of pathology and of selective capacity and of pathogenic organisms, would we not be fools if we held to the same opinions to-day that we held when Foster Flagg defended the filling of roots with cotton on the ground that experiments with a test tube containing contaminated material proved that the cotton prevented the ingress of organisms? But that absorbent cotton was not in contact with the contaminated material in the test tube; and we know to-day that if you put cotton and creosote in a tooth in contact with putrescent matter, it is not very long before the cotton itself is contaminated also. So we are going on from grace to grace and from glory to glory—that is more Scripture!

## Rural Health Caravans and Pre-School Age Dental Clinics\*

GEORGE KERR THOMSON, D.D.S., L.D.S., HALIFAX, N. S.

IN 1885-6 in England when the question of school dentistry was first given consideration by the British Dental Association and 30 school dentists were appointed by the Government to provide dental services for the "Poor Law" as well as the elementary schools, was originated the world-wide oral hygiene propaganda which today has assumed such large proportions, and is undoubtedly a most important factor in the public health.

In 1898, in England, the school dentists on duty in these schools formed the School Dentists Society, which has been such a help to us in our work in Canada and the United States, where in the latter country the work was begun in the same year by the National Dental Association.

The present Oral Hygiene campaign in *Canada* may be said to have begun in 1908, when the examination, *under the authority of the Government*, of the teeth of school children in Halifax, and the reading of two papers in School Dentistry at the 1908 meeting of this Association at Montreal led to the appointment of the C. O. P. A. as our Educational Committee. Previous to that date Dr. Adams of Toronto and other pioneers in this work made an examination of the school children in Toronto, and directed the attention of the Government to the necessity of dental services for them, but without result so far as any provision by the Government

\*Paper read before Canadian Dental Association, Montreal, August, 1920.

being made at that time was concerned. No doubt Dr. Adams' missionary work at that time in this connection bore fruit at a later date, when the school dental services in Toronto, which have been so splendidly developed, were organized, and in which the Ontario Dental Society has played such an important part.

In this connection the wonderful work of Dr. Doherty of Toronto, who practically sacrificed his life in the interests of the public, will never be forgotten.

It is quite unnecessary for me to inform you of the great advance in public dental education and school dentistry in Canada which has taken place since 1908, and which is largely due to the work of the C. O. P. A., the biennial report of which has just been received. These reports we hear read every two years, seem to be better each time we hear them, and I think we all agree that this last one is the best of all.

The C. D. A., as well as the C. O. P. A., is to be congratulated on the new Executive of the latter Association, Dr. H. S. Thomson, but we have also been very fortunate in the past in having the *voluntary* services of the men who have served for years on the Executive Committee. I do not think we realize how much the Canadian public owes to these men in Ontario who have given so much of their time and energy to this work and although they will still continue to serve, it is quite time that a paid Executive should be employed. In fact it is time that voluntary work on the part of any members of the profession should be unnecessary—the Government of the country is able to employ officers in other Branches of the Civil Service. Why not in the Dental Branch of the Public Health and Educational Departments?

With a view to obtaining definite official information with regard to the relationship between the Federal and Provincial Health Departments, the question was asked if any financial assistance could be given the Provincial Health Department by the Federal Department in the same manner as that of the Highways. The reply was received that the only financial assistance given was in the case of venereal diseases, but no suggestion was made that it would be impossible to make an arrangement of that kind. *It may be that a recommendation by this Association to that effect would be desirable and aid in obtaining such assistance.*

It is quite natural that there should be a difference of opinion among the members of the profession with regard to the best method of educating the public and providing services preventive and otherwise, but no matter how much we may differ with regard to the *remedy* we must all realize that it is absolutely impossible for the number of dentists in practice and embryo to overtake the ravages of this most common disease in the world, "tooth decay," and fur-

ther, it must be admitted that old adage "prevention is better than cure" applies in this as well as in other diseases, and that a *practical system* of providing preventive dental services would be a better remedy than any in existence at the present time.

In England there is at present a difference of opinion among the school dentists as to the employment of "dental dressers."

In the United States and Canada we have a difference of opinion with regard to the employment of "dental hygienists," although it has been conclusively proved that so far as preventive dentistry in the schools is concerned the system originated by Dr. Fones in Bridgeport, and now provided for by legislation in over 15 of the United States, is most practical and valuable. A further development of this excellent system is the suggestion by Dr. Fones in his address in March, 1920, before the Illinois State Dental Society of "Burbanking," (to use his expression) the medical nurse and the dental hygienist, and call her the "Public School Hygienist."

Last autumn I had an opportunity of discussing this matter with prominent members of the dental profession in the U. S., and was impressed with the fact that some of the most bitter opponents of the dental hygienist system in its earlier days are now very much in favor of it. I was also impressed with the danger of the dental hygienist being commercialized, but it does not appear that this disadvantage can compare with the enormous amount of good they accomplish.

In Ontario, Nova Scotia and other parts of Canada we have the "school dentist" with the school nurse for assistant, which appears to be an excellent system so far as it goes, but it does not and can never possibly go far enough, for obvious reasons, which have been frequently stated. Personally, I do not think that either the dental hygienists or the qualified dental practitioners with their present limitations will ever cope successfully with the situation. The dental hygienist, as you are aware, is only permitted to remove the deposits and bacterial plaques, polish the teeth, and instruct the patient in the home care of them. The practitioner, on the other hand is expected to perform all the reparative as well as preventive operations which the dental hygienist is not permitted to do; and as stated before there are not and never will be a sufficient number for that purpose. In New Orleans I had an informal but lengthy discussion on this matter with Drs. Paul Stillman of New York, Harold Box of Toronto, and Mr. Jenkins of Kolynos fame, in the course of which Dr. Stillman made a suggestion that the professional nurse with a training in practical prophylactic treatment, would be the ideal preventive remedy, this being practically the same suggestion as made by Dr. Fones in March, 1920. This seemed to me the solution of our difficulty in Nova Scotia, provid-



ing that the child received preventive services early enough, which would be at the age of 3 or 4 years. Up to the present time although pre-school age care of the teeth has been advocated and taught, no definite action with regard to the services of the dental practitioners or hygienists *in a public way* has been taken by the profession or Government authorities. It is only by a fortunate coincidence that we have an opportunity of beginning work along these lines in Nova Scotia this year. Doubtless you remember the wonderfully prompt and generous assistance rendered Halifax by the State of Massachusetts, immediately after the terrible explosion of 1917, the response being so generous that after the immediate relief program had been completed about one quarter million dollars remained. This balance is now being spent in the establishment of health centres, one of which has already been established in the old Admiralty House, Halifax, which has been placed at the disposal of the committee. Last winter about 14 trained nurses received a special course, qualifying them for public health nurses. In this course were included lectures and demonstrations on oral hygiene and practical prophylactic treatment, by dental practitioners, thus qualifying our public health nurse to provide preventive dental services for the child of pre-school age. *This oral hygiene qualification is compulsory and none other than public health nurses will be employed in the schools or health centres.* In this connection it should be understood that Provincial Health Department, the Massachusetts-Halifax Health Commission and the Red Cross Society co-operate, at present the two latter bodies providing the funds. The expense of establishing health centres throughout the Province will be borne by the respective counties in which they are situated. So far as Halifax is concerned, the expense will be borne by the Massachusetts-Halifax Health Commission from the Executive of which a letter has been received by our Oral Hygiene Committee suggesting the establishment of a pre-school age dental clinic with each health centre, and requesting our recommendations and co-operation in connection therewith. Our Committee now has this offer under consideration and will recommend that these pre-school age clinics be under the supervision of a registered dental practitioner who will see that all prophylactic dental treatment, *including the application of nitrate of silver* and the insertion of antiseptic cement fillings in the sulci of teeth showing superficial decay is properly performed by the public health nurse. He, as well as the nurse, will instruct the parents in the home care of the teeth, particularly with regard to the diet, where the use of free-sugar will be discouraged, the nurse seeing that the instructions are followed in the homes.

Pre-natal lectures will also be given to the parents.

Of course, it is understood that the nurses will visit the homes



and arrange for the attendance of the children at the health centre clinic. In this way the children of pre-school age, which heretofore it has been impossible to reach, will receive preventive dental treatment which will enable them to begin school life without the handicap of an unhealthy mouth, under which so many of the children enter school at present. The good accomplished by this method will only be limited by the number of public health nurses with these dental hygienic qualifications who can be trained and employed. In time this will materially reduce the number of reparative operations required, and fewer school dentists will be required than would otherwise be the case. This would not interfere with duties of the public school hygienists suggested by Dr. Fones.

Now, Sir, my object in directing the attention of this Association to this remedy for the grave situation which exists today, is not because we have results to show, or to prove its efficacy, but rather to promote discussion of the scheme, which may result in the adoption of some standardized system along these or similar lines approved by this Association.

#### RURAL HEALTH CARAVANS.

Another opportunity which presented to our committee was in connection with the Red Cross Health Caravans, which for the last 6 weeks have been operating in Nova Scotia.

These Caravans, as some of you are aware, are a method adopted by the Red Cross Society for doing the most good to the greatest number in times of peace, as it did in the late war, and it is expected that owing to the success of these clinics in Nova Scotia they will be in operation in every Province in Canada.

They have attracted the attention of health experts from all parts of the continent, and are of sufficient importance to have been visited by Dr. Robertson of the Red Cross, Ottawa, Dr. Fitzgerald of Toronto, and Dr. Vincent, of the Rockefeller Foundation, with a view to general adoption, and possibly endowment by the Rockefeller Foundation.

They consist of motor ambulances fully equipped for operations of all kinds, but particularly those of the mouth, nose and throat, 3 ambulances, 2 motor lorries, 1 moving picture lorry equipped with latest type of picture machine, which is also used for lighting operating theatre—comprise one unit; 3 medical specialists with 5 public health nurses and one dentist with public health nurse as assistant accompanied each unit.

Efforts were made to obtain two of the motor dental ambulances used in the late war by the American Army, but as these were not available, two international ambulances were borrowed, which although not equipped like the Preparedness League ambu-

lances, were found quite efficient for the purpose. It was at the request of Lt.-Col. F. V. Woodbury, son of your President, that arrangements were made for sending a qualified dentist with each unit at the expense of the Red Cross, and the results of their work show that the scheme of travelling dental clinics for the outlying districts of Canada are most practical and efficient.

We were very fortunate in obtaining the services of two of our committee who are most prominent ethical practitioners and deeply interested in the propaganda.

One of them, Dr. F. W. Ryan, is here today and will no doubt give us an interesting account of his work in this connection. We are so impressed with the value of these health Caravans and pre-school age dental clinics that we think it desirable that this Association should pass the following resolutions:

1. That this Association approve of the organization of pre-school age dental clinics and travelling dental ambulances in connection with the public health or Educational Departments throughout Canada.
2. That the Oral Hygiene Committee of this Association keep in touch with the Federal and Provincial departments of Public Health and co-operate with the Provincial Oral Hygiene Committees in systematizing and standardizing the public dental services so that the same method may, as nearly as possible, be adopted throughout Canada.

#### DISCUSSION OF DR. THOMSON'S PAPER.

**D**R. F. W. RYAN (Halifax): Mr. President and Gentlemen,—I did not know until this morning that my name was on the programme to open the discussion on this report. However, I am sure we all approve the work which is outlined in it.

There are many things which I would like to discuss in connection with this report on Education. I am not sure just what this Educational Committee are doing; whether their work is the education of the dentist or of the public, or of both. We have seen how necessary it is—I am thinking particularly of Dr. Seccombe's address the other day—that the education of the dentist should be more extended.

It has often occurred to me that in the combatting of infectious diseases three primary considerations are involved: the matter of infection itself, the number and virulence of the organisms, and the resistance of the tissues. Now, hitherto we have been largely basing our methods of practical treatment on those factors which relate to the virulence and the number of the organisms. This involves instruction along both pathological and bacteriological lines; and, as our essayist has said, we have not accomplished very much in that direction. We are teaching prophylaxis; we are teaching cleansing; our slogan has been "the clean tooth doesn't decay," and we have now got to the point where we are almost educating a new profession called hygienists to look after that particular branch of our work. We all feel that it has not accomplished or is not likely to accomplish the thing we intended it to accomplish. When we think of the number of children that are born every year and of the number of teeth that they have; that in each child the surface of each tooth must be scoured and brushed and polished—well, the task seems

herculean. Now we are beginning to turn to the other phase of the matter,—the resistance of tissues to the attacking forces. If we can increase the power of resistance of the tissues so that the attacking forces cannot penetrate, we shall accomplish what we tried to do on the other scale. From the addresses of Dr. Seccombe and Dr. Husband it looks as if we can accomplish a little more by paying attention to the matter of diet,—to fundamental principles rather than to the physiological, pathological and bacteriological phases of the question. It seems that way, anyway.

So much for the education of the dentist; now, as to the education of the people. I know that I was put here to talk about those caravans. Anyone who is at all connected with the public health movement cannot help feeling that the people are asking for information. They are saying: "What shall we do? How can we keep our children's teeth in proper condition?" It is simply a matter of the education of the people; the imparting of information to them as to what they should and should not do. But in connection with these public health clinics and propaganda, while it is desirable to have clinics and schools and so on, to relieve people of pain and to do the actual work, it is not of much use to educate people whose habits in life are well established. The greatest good is accomplished by getting at the child in the school or at the pre-school age and get him accustomed to the dental services, to the chair and the ministrations of the dentist and that sort of thing. That would go a very long way toward relieving them from the effects of fear and causing them to acquire good habits. Now, that is what the health caravans have been doing in Nova Scotia. Of course, the work is managed and financed largely by the Red Cross Society. The health of the people is undoubtedly a governmental function; there is no question about that. It is the duty of a Government to look after the health of the people whom they govern. Unfortunately, however, many of our Governments have very little money or think they have; or they have other ways of spending it that are more profitable, they think, than expenditure made in the interests of public health. They are not sufficiently educated,—that is another thing; we ought to educate the Governments.

When the Red Cross Society came to demobilize their organizations at the end of the war, and when they had regard to the conditions disclosed in connection with the recruiting of soldiers and to the fact that large numbers of men were incapable of defending their country and their families; when they realized the amount of suffering and distress that had been occasioned by the war, those who were in charge of the Red Cross organizations of the different countries—United States, Japan, Great Britain, France and Italy—decided to see if something could not be done with a view to using all this great machinery for the betterment of the people and the general improvement of health conditions. Representatives of these five national Red Cross Societies met in France and decided to approach an international committee that had been established years before at the Congress of Geneva to see whether something of this kind could not be done. Eventually they did confer with this committee, and at their first meeting with them they found, strange to say, that the Committee had forwarded a communication to them containing suggestions along exactly the same line—that the machinery and power and forces of the Red Cross Society should be used in times of peace as well as in times of war. It was found that this International Committee could not take up this work in time of peace, chiefly because, in the first place, it is a universal and neutral organization and could not work for any particular nation; their energies were for the whole world. So it was, I understand, that the League of National Red Cross Societies was formed at Geneva. When they were there they had a great meeting—I think that about thirty different nations or governments are in the League now—and the result of their deliberations was the adoption of a peace programme for the activities of the Red Cross, principally to promote the



general health of the people. Their primary object was to restore the vitality of the Red Cross Society in order to raise money for the assistance of all their activities that made for the public good,—Victorian Order of Nurses; Child Welfare; tuberculosis leagues, and so on; the Red Cross will abundantly assist them, financially and in every other way.

Nova Scotia was one of the first of the provinces to take this work up through the adoption of these health caravans that travel through the more remote districts carrying with them the blessing of relief from suffering, but more particularly teaching the people how to conserve their natural health. This work which is being carried on through the health caravans in Nova Scotia is likely to be adopted, as Dr. Thomson says in many other places. Services of an itinerary nature have on occasions been rendered to the people of some parts of the country, but never, as far as I know, on such an extensive scale as the work which is now being carried on in Nova Scotia.

This caravan comprises a complete hospital outfit with tent beds and all the necessary paraphernalia,—largely borrowed from the Army Stores of the Canadian Government, supplemented by such instruments and machinery as each specialist might want in his particular line. They are loaded into these ambulances and carted from one place to another.

We were particularly struck with the anxiety of the people in these outlying districts to receive benefit and instruction from the caravan. We did follow the line of railway, in a sense—that is, we were always coming back to it; but we would go to the little villages and hamlets some distance away, set up our hospital in a schoolhouse or hall, whatever place could most conveniently be found to suit our purpose; and the people would come to us in droves, sometimes from dozens of miles away. In many instances we found large numbers of people with their families sitting on the steps waiting for us.

Of course, the thing that appealed to me particularly was the dental service; that was my particular sphere. As Dr. Thomson said, we had six nurses. One was assigned to me, and besides, I had a boy-scout to run errands and do various things for me. Little children would come in in fear and trembling; it struck me that the first thing we needed to do was to allay their fear in every possible way. Of course we can do a great many things now without pain by injecting local anaesthetics. These children would come in and I would take out their teeth, where necessary, without hurting them. I cleaned their teeth, rubbed nitrate of silver over the surfaces of their first-year molars without hurting them, and so on, and the little chaps would get out of the chair smiling. The result was that the next little chap in turn would come up quite cheerfully, and soon they were crowding to get into the chair. That is the spirit that we need to cultivate. I found in one or two cases that if the first patient did not come off quite so well; if the tooth hurt or something like that happened, the result was a damper on the whole proceedings while we were at that particular place. So I took the precaution not to hurt the first patient. That is, if I found that the case required treatment which would hurt, I would put him off; tell him I had not the right medicine just now; then bring in another and keep on until I got two or three patients whose treatment did not hurt them. The elderly people we operated on only to relieve pain; if they wanted more than that they were told to go to their regular dentist; that this was not for them.

After we got through with the children we would give them a tooth-brush and one of the pamphlets issued by the Canadian Oral Prophylactic Association on the care of the teeth. These pamphlets proved to be of splendid service. We were bountifully supplied with them, and nearly every person who left the chair got one,—and a great many also who did not leave the chair. Wherever we held meetings at night the Scouts would stand at the door and present these things as the people went in and out; so they were pretty well distributed over the Western part of Nova Scotia.



The other clinic that approached the dental clinic in practice and so on was the removal of adenoids and tonsils for children. One specialist would deal with as many as fifteen or twenty cases of adenoids in children in a day; I think fifty patients was the largest number I ever had at any one clinic. That was in parts of two days, but ordinarily it ran from twenty to thirty patients each day, or a patient every ten minutes. You cannot do very much permanent work. You can do a lot to relieve the patient, and that kind of thing; but the point was the education of the people. That is what we were instructed to do, and we did it all the time,—talk, talk, talk. At night after the clinic was over, some time between four and five o'clock, all our paraphernalia would be packed up in the boxes and loaded on the van ready for the start in the morning. Then our moving picture show provided entertainment for the people in the evening,—with more talk; talk all the time. Some evenings we would have two or three different meetings in different little hamlets. The instruction afforded by the moving pictures was a valuable feature of the work; they appealed strongly to the people in the outlying districts, where moving pictures are not as common as they are in the larger towns, and wherever they were shown the halls were crowded.

The dental clinics were particularly attractive, with many thanks to the Canadian Oral Prophylactic Association. They were put on every night; they were instructive as well as entertaining,—so much so that after we had been in a given place for two or three days we began to get appeals from towns ahead asking us to stop with them. Of course, to a large extent we had to stop where we were told to stop. But just as I was leaving it—I was there for three weeks—the towns began to celebrate as we came in; the children would be out waving flags, and so on; so we were getting quite popular. I suppose it is not quite so popular since I left; it was at that time, anyway.

In the evenings, as I say, we would have these moving pictures, and on Sundays we would go through the towns and speak in the Sunday schools and churches with the idea of educating the people. Everywhere we were received with confidence, apparently; certainly the people were glad to see us. I do not know of any better means of practically educating the people to the necessity of protective and preventive measures than through the travelling rural health caravan. There are many other things I would like to have said, but I feel that my time is up. I thank you.

---

## Alumni Society of the Dewey School of Orthodontia

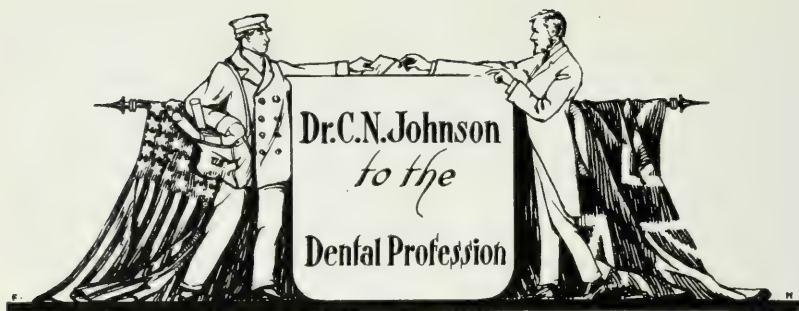
---

THE next annual meeting of the Alumni Society of the Dewey School of Orthodontia will be held on April 25th and 26th, 1921, at the Hotel Ambassador, in Atlantic City. The usual high standard of the meetings of this society will be maintained. Clinics and evening sessions will be included in the programme. All interested in Orthodontia are cordially invited to attend these meetings.

GEORGE F. BURKE, Secretary.  
741-43 David Whitney Bldg., Detroit, Mich.

---

ROOT CANALS.—Screw an old hypodermic needle on the end of a chip syringe, and use for drying out root canals—*E. P. Bateman, Katoomba, N.S.W. (Dental Summary).*



## Chicago to California and Return

**I**T has occurred to me that there might be something of interest in the recital of my experiences on a recent trip to California, even though California has been written up so many times that nothing new can be said about it. Travel is the greatest of all educators, and no one can become really well informed upon any country or locality without having visited it. The difference is akin to that between trying to teach students solely by lecturing, or by the process of demonstrating. If you merely *tell* a student how to do a thing, he does not always get a clear idea of it, but if you *show* him how it is done, the impression is made on his mind and he grasps it—if he can grasp anything.

I left Chicago Feb. 6th, and went direct to Los Angeles—that is, I *started* for Los Angeles, but at San Bernardino I was taken bodily from the train by some of my Los Angeles friends who had driven up to meet my train for the purpose of escorting me by automobile the remainder of the journey. Of course, among the party was my good friend, Dr. J. P. Buckley (I am going to steal him yet from Los Angeles and take him back to Chicago.) Then there were Dr. L. E. Ford, Dean of the Dental Department of the University of Southern California; Clarence Buckley—grown to be a big boy since I had seen him—and my dear old friend of many years, Dr. Edmund Noyes, of Chicago, who was up on the coast for a vacation. “Gus” Miller, formerly of Chicago, but now of San Bernardino, also came down to the train to bid me welcome to California. What a delightful experience it all was!

We drove down through the orange and lemon groves past Claremont, Glendora—where my friend, Dr. Maurice Crow, has an office and an orange grove—to Pasadena and Los Angeles. Such a drive—I shall never forget it. Dr. Crow afterwards placed on the table before me at a dinner given in Los Angeles two branches cut from one of his orange trees so laden with fruit that it was almost unbelievable. I do not recall just how many oranges were on these branches, but they were sufficient in number and weight to

make a very respectable load for me to carry to my room that night after the dinner.

To chronicle all of the happenings in and around Los Angeles during the week I was there would be to write a book. To even mention all of the dear fellows who were kind to me would be to give a roster of the membership of their societies. Such hospitality, such spontaneous goodwill—well—go to California, and see for yourself.

I saw the Hartley boys—Charles and Ralph—both princes, and both better off than if they were in Germany, where they formerly were. They originally came from Brantford, Ontario, where many good boys were raised. It was a distinct loss to Ontario when these boys left. Then there was Dr. Julio Endelman, Editor of the *Pacific Dental Gazette*, looking much more rugged and healthy than when he lived east—oh, that confounded California climate; it does seem to “get” people, even though I have many times softly sworn inwardly when Californians, bless their hearts, have so constantly raved about it.

One day Dr. B. B. McCollum and Mrs. McCollum drove me down to San Diego, about 130 miles, through a most beautiful country, over magnificent roads, lined on either side with orange, lemon and walnut groves. I have never seen anything like it in all my life. I had, of course, been familiar with the orange and lemon orchards, but the walnut industry was a revelation to me. Great expanses of these beautiful trees were spread out in orderly array for the eye to feast upon. And I am told that this is really a more stable industry than oranges or lemons. This year the latter are so cheap that, while the crop is good, there is little money in it. In fact, along the roadside one could see boxes of lemons set out with the sign on them: “Help yourself, but leave the box”—the box being more valuable than the lemons. There is no land so beautiful, or prosperous, or prolific, that the shadows here and there do not sweep across its surface. Everywhere I go I am reminded of Emerson’s essay on “Compensation.”

Another striking sight is the presence of literally hundred of oil derricks sticking out of the ground, sometimes in the very midst of the most beautiful orange groves.. Of course, every one knows that the oil industry has in recent years been one of California’s most active assets.

At San Diego I had the pleasure of dining with the County Dental Society and addressing them at a subsequent meeting. Dr. McCollum and I were treated right royally by these men, and the entire trip was a delight. To show the kind of men they have in Southern California, one of the members—Dr. Fox—drove over from Imperial Valley to attend the meeting, a distance of more than a hundred miles—to be exact, I believe he said it was 125 miles. Would you and I do *that*?

An incident of special interest to me happened at San Diego. I called on an old friend whom I had known quite intimately back in the early '80's at Collingwood, on the Georgian Bay. (It was there I got my first start in dental practice, and I love the residents of that town with a peculiar affection.) Almost his first greeting was: "Did you get my letter?" I replied in the negative. "Well," said he, "when you return home you will find it waiting for you, and in it a gold filling. The other day I had one of my teeth cut off for a crown, and it contained this filling, which you had inserted forty years ago. I broke the tooth to get the filling out so I might send it to you." Verily the practice of dentistry has its compensations, even though sometimes they may seem to be long deferred.

But if I ramble on in this way I shall never complete the account of my visit to California. As it is, I must make another instalment of it in the next issue.

*C. H. Johnson*

---

### Obituary

---

**D**R. WILLIAM RICHARD GREENE, Director of Dental Services, Board of Health, Toronto, died at his home, Toronto, on the 23rd February, 1921, in his 52nd year.

For many years Dr. Greene practised the profession of Dentistry in the City of Ottawa, and had served as a member of the Public School and Library Boards.

Dr. Greene enlisted in the Canadian Army Dental Corps, and served during the War with distinction, attaining the rank of Major and taking a prominent part in the organization and administration of the C.A.D.C. Overseas.

Though Dr. Greene had been in charge of the Dental Services in the Health Department of Toronto for less than a year, he had shown exceptional administrative ability, and was recognized as an unqualified success in the civic service.

Dr. Greene had many warm friends throughout Canada, who greatly admired his sterling qualities, and who extend to Mrs. Greene and family sincere sympathy in their loss.

---

FORMULA FOR SENSITIVE DENTIN.—Zinc chlorid, twenty grains, four drams each of alcohol and chloroform. This is not a panacea for all cases; but in large cavities, in molars and bicuspid, which approach the pulp, its use is very gratifying. The alcohol is necessary to effect a solution.—*Elmore W. Elliott (Dental Facts)*.



# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, MARCH, 1921

No. 3

## EDITORIAL

### Dental Service in the Schools of Toronto

THE Dental Staff in the schools of Toronto, embracing both Public and Separate Schools, is composed of:

A Director of Dental Service.

32 Graduate Dental Licentiates.

23 Dental Nurses, who act as assistants to the School Dentists.

The work includes both educational and reparative Dentistry, and involves classroom instruction, oral examination, prophylactic treatment, and operative procedures. The entire Dental Service is carried on within the School building. This plan has been in operation for the past eight years, and is found to be entirely satisfactory. Such a system of School Dental Service overcomes the necessity for establishing Dental Clinics in separate buildings, with the consequent overhead expense. It is also found an advantage to organize the Dental Service definitely as a part of school routine, thus taking advantage of the school regulations and discipline for the better control of the children, and assuring sympathetic co-operation upon the part of both scholar and teacher.

Working under such a plan, it would be ideal if every school was equipped with a Dental Clinic. Toronto may look forward to that objective as a probability, the Building Department having

issued a standing instruction that accommodation be provided for a Health Unit (physician, dentist, nurse) in every new school to be built. There are now 24 Dental Centres distributed throughout the Public Schools, and 5 Clinics in the Separate Parochial Schools of the city.

The number of schools served by each "centre" varies according to the special need in each district, but in no case is a school further removed from a dental clinic than enables the youngest scholar to walk unaccompanied by an attendant.

Most of the clinics are in operation during the morning school hours, though a few are also operated in the afternoons. By employing dentists for half-time service, it is found that a better type of operator is available, he being permitted to engage in private practice for part of each day.

Friday afternoons are devoted to the pre-school age clinics, when mothers may come with babes or children up to five or six years of age, and obtain advice regarding the dental condition of their children during the important developmental period previous to attendance at school.

Special corps of dentists are set apart for Preventive Service. For this special purpose the city is divided into three sections, and a school dental officer with nurse-assistant placed in charge of each district. The duty of the Preventive Officer is to make survey, examine mouth, and where needed give prophylaxis, at least once each year, besides carrying on educational work, classroom instruction, tooth-brush drill, and work of that character.

The Home and School Clubs, organized by parents, with the assistance of teachers, and holding monthly meetings in the school buildings, have been of great assistance to the School Dental Officer. The preventive campaign, including, as it does, the whole question of general hygiene and the problem of diet, must make itself felt in the home as well as the school.

Under the Toronto plan, the entire work is carried on by graduate dentists. Each operator is assigned a Dental Nurse, who assists the School Dentist in every way, but who does not make examination of the teeth nor give prophylactic treatment. It has been felt that these functions require the experience and skill of a graduate practitioner.

---

MELTING ALUMINUM.—In melting aluminum previous to casting, new clean ingots should always be used. The metal should never be overheated, and, when fusing, should be slightly agitated with the end of an ordinary slate pencil from time to time, and all dross removed, until a smooth, clean surface presents, after which the casting should be made, observing only moderate speed in doing so, as the metal remains liquid for some moments.—*Dental Review*.

## Just Keepin' On

BY NINA M. LANGFORD

SOME days it doesn't seem worth while,  
Even to smile.  
'Pears like I better quit  
And rest awhile.  
No use to keep a-goin'—  
No use to try, I say.  
Yet I dunno. I might be glad  
Fer keepin' on—some day.

The other folk who've reached the goal  
Of which I dream,  
I s'pose had days like this  
Without a gleam;  
And they kept goin' on.  
Guess it's the only way!  
To-morrow I may reach the light  
By keepin' on to-day.



ARTHUR D. BLACK, A.M., M.D., D.D.S., Sc.D.

*Dean, Northwestern University Dental School  
Chicago, Ill.*

***D**R. BLACK has rendered exceptional service to the Dental Profession through his untiring and unselfish services to the Dental Index Bureau. The first volume of the Index was recently published, covering the five-year period from 1911 to 1915.*



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, APRIL, 1921

No. 4

## The Jacket Crown. Its Limitations and Uses\*

A. L. LEGRO, D.D.S., DETROIT.

**S**IGNIFICANT is the fact that during the past twenty years no attack upon, no censure or criticism of the all porcelain jacket crown has been offered by individuals or organizations. The procedure of stripping the natural enamel from a vital tooth and replacing with a jacket of fused porcelain has had comparatively few constant champions, and, strangely enough, no serious objectors.

If logical argument or demonstration had made a single sincere attempt to discourage the use of porcelain for this work, one could readily understand why so few, comparatively, had given it the important place in practice to which it is justly entitled. Perhaps our old friend, Dr. Darby, had the right idea when he said, many years ago, "Porcelain work will be valued just in proportion to the careful discrimination which is exercised by the operator." If he was right, the present status of porcelain in the average practice is a severe indictment of the average dentist's judgment, or of the art itself. An argument that seems to more readily coincide with the ideas of the writer is that diffidence born of inadequate technic and the very false idea that only individual artists can produce these beautiful results, has caused the average practitioner to confine his operations to those restorations in the execution of which he has the most confidence so far as his own individual ability is concerned. It is not the purpose in this paper to offer a dissertation on this subject as to all of the causes why operators do or do not take up this work, but rather to strengthen the argument in favor of porcelain jackets for all individual crown restorations. Porcelain jacket crown technic, however, seems to be the only phase of the dental ceramic art that shows signs of healthy growth. We have assimilated into our knowledge of this

\*Address delivered before Toronto Dental Society, March 14th, 1921.

subject only such useful and practical parts of what we have digested as we have found most available.

The ideal crown is the jacket or its modification that forms a direct continuation of the root, i.e., a restoration—replacing fully, perfectly and only, if desirable, the space formerly occupied by the lost or removed tooth substance. It is the only restoration that restores practically normal conditions. There is no angle, anatomical contour or shape that cannot be produced in porcelain. It is possible to reproduce accurately the much-abused bucco-gingival ridge, which the writer has never seen reproduced perfectly in any material other than porcelain. Surface alignment and marginal adaptation capabilities are perfect.

When the Detroit Clinic Club was first established, and the writer made director of the Porcelain Crown section, it seemed as if this section would be wrongfully named if we did not teach the technic of all well-known porcelain crowns and their adaptation. We are to-day teaching and advocating but one porcelain crown and its modifications, namely, the so-called jacket or porcelain veneer.

Study and experience has forced us to recognize the porcelain jacket or veneer as the most reliable, cleanly and serviceable individual crown, whether molars, bicuspid, or anterior teeth, either upper or lower, that has been devised up to this time. This decision has been reached only after a careful consideration of the advantages of all other forms of crown restoration. We have found but two exceptions to this rule, which I will speak of later, and these exceptions tend to lend great emphasis to the argument that is offered in favor of the porcelain jacket for all individual crowns.

The application of this crown to the anterior teeth, both vital and otherwise, as an accepted practice, is the result of many years of hard work on the part of those pioneers whose vision carried them far beyond the ordinary and accepted conventions of the average practitioner.

In the beginning it seemed difficult to believe that a thin veneer of porcelain could possibly have the strength to withstand the enormous direct and lateral pressure that it would encounter in the function of mastication. But time and experience has taught the observing that a properly constructed veneer, well fitted to a square shoulder, be it ever so narrow, was about as strong a tooth restoration, maintaining healthy gum conditions, as had been devised up to this time.

We know that a well made and properly fitted veneer has these qualities:—

1. Adequate strength.
2. Capable of being used on all anterior vital teeth, and maintaining vital healthy condition of pulps for an indefinite time.
3. Food particles do not readily adhere to them.

4. Absolutely no irritation to soft tissues.
5. Simple of construction.
6. Possesses all the good qualities of natural enamel; and, last, but not least, is the most aesthetic reproduction that the dental artist is capable of.

These qualities are firmly established in the minds of all operators who have taken up this work, but most of them have not gone far enough and recognized the enormous advantages of using this form of restoration in all posterior cases.

I know of but two cases or conditions that contra-indicate the application of porcelain jackets in posterior teeth, namely:—

The exceedingly short bite and short teeth;

And those cases that have been filled all over practically with plastic filling material, and the pulp has receded so far that devitalization would be both difficult and harmful.

We assume that, aside from such exceptional cases as these above mentioned, all posterior teeth the natural crowns of which are destroyed by caries or other causes to such an extent that filling restorations could not be made effectively available, devitalization and complete excision of the remaining portion of crown is advantageous. In other words, if the walls remaining are too weak to retain an inlay or permanent plastic filling, no further harm could be done by excision of crown. Only in very rare and exceptional cases should the gold shell crown, no matter how well constructed and adapted, have any place in the present-day high-class dental office practice. Only in the two cases before mentioned is there any excuse for the gold shell crown. For abutments in bridgework a gold jacket, or so-called  $\frac{3}{4}$  veneers should be employed in all cases. Gold shell crowns are filthy things at best, and when they do not present this very objectionable quality or defect, it is through no fault of the crown.

We offer as a substitute in individual crowns the porcelain jacket over vital or devitalized anterior teeth, and the porcelain jacket over cast metal cores for the posterior teeth. They possess the one good quality of the gold shell crown, namely, strength—none of its bad ones and many additional good ones. We offer with it a technic that, in the hands of the average careful man, will bring good and uniform success.

If I may digress for a few moments before going on with a description of technic, I will discuss briefly definite occlusions, for without definite occlusions in porcelain, as well as all other restorations, we have but little.

We have boasted of the wonderful progress in our profession while we have, for many years, persistently ignored the beautiful handiwork of nature as portrayed in individual tooth forms. Up to a few years ago we educated our patients to ask for and demand "fillings and crowns that would stick." The dentist demanded no



more of himself nor did he know more, and the patient asked for only that degree of perfection. So long as the filling held firm and prevented further decay in given cases, everybody was satisfied and seemed to care little if efficiency was lessened, as was invariably the case in ninety per cent. of restorations.

The advent of the cast gold process in 1907 awakened the profession to its many possibilities. Dr. Taggart laid no little stress upon the necessity of carving wax true to tooth form when he first showed his beautiful castings; but, like many other things that were given at that time, most of us overlooked, only to recall later after bitter experiences, some of those earlier admonitions.

A few years ago Dr. J. Lowe Young, an orthodontist of New York City, and subsequently Dr. Ottolengui as reporter, together with others, laid especial emphasis upon the necessity of making all restorations true to tooth form and environment that were possible. The profession with one accord, as if the idea was a new one, immediately availed themselves of this suggestion and its wonderful possibilities and, as a result, the efficiency of dental operations was raised very materially through the instrumentality of these men.

The mortar and pestle on the one hand, and the flat slab and pestle on the other, will serve to illustrate in a way the difference in efficiency between the occlusions as they obtained in ninety per cent., at least, of cases prior to this, and those advocated by recent clinicians and writers. A chemist would not think of attempting trituration of any material on a flat slab; he would demand that a mortar be used in order that the material would fall back and automatically feed the pestle while in grinding motion, and thus facilitate the work to accomplish thorough results. That, in a way, is just what takes place during mastication in the occlusal surfaces of all posterior teeth. The cusps with their planes formed by the ridges, working into fossa of occluding teeth, but more perfectly accomplishing their work than the chemist's mortar and pestle—for Nature has elaborated on this process and with the aid of the muscles of the oral cavity nothing escapes complete trituration providing the function is carried out.

About twenty years ago, I believe, the "point of contact" craze swept over the profession, and it was considered the last word in fillings and restorations. It certainly was a great step forward, and many of you can recall, no doubt, the feeling of confidence with which you promised to correct the otherwise perfect work that was causing the patient so much discomfort owing to a wide space into which large particles and shreds of food were crowded. After getting a good separation a restoration was made which restored the point of contact, only to find that the difficulty was not solved entirely in all cases. For fifteen years the profession was just that far



and no farther. Nature had not stopped there, but man had, and after all these years it is suddenly discovered that a tooth has marginal and bucco-gingival ridges, and the fact that they are so persistently present in all teeth forces the hypothesis that they have a very important function. The marginal ridges on the bicusps and molars incise and help to throw the food to the fossa or mortar of the teeth, where the pestle in form of cusp of occluding teeth, with their triangular ridges and planes, trap the food and masticate it properly. Teeth in normal occlusion that are abraded to the extent of obliterating cusps, planes and grooves, in part or whole, are the result of highly developed muscles primarily, and subsequently the necessity of further pressure to make useful the occlusal surfaces that were originally sharp. The minimum amount of pressure is required to properly tear and masticate the food in teeth with sharp cusps and deep sulci, and naturally the maximum of pressure needed is reached when the occlusal surfaces are worn flat. At this stage the marginal ridges, which are the strongest features architecturally of a tooth, are obliterated, and chipping or breaking of the tooth during mastication is quite frequent. In other words, teeth with well developed marginal ridges do not chip or split and are at their maximum strength when not abraded or encroached upon by fissures and decay.

It is therefore evident that the marginal ridges present two of the most important, if not the two most important, features of the tooth, namely, completing the maximum strength of the tooth and incising and forcing the food away from the approximal surfaces towards the centre of tooth, there to be trapped in fossa and properly ground as with mortar and pestle.

The approximate points of contact and the marginal ridges do not by any means comprise all the points of dental anatomy that need emphasis. The gingival ridges, especially the bucco-gingival ridge, the buccal and lingual grooves in molars, the angle of the occluding surfaces when viewed with the axis of the tooth, self-cleansing surfaces, thickness of gums protected by gingival ridges, the height of cusps relative to the general articulation—all furnish a study most wonderful and interesting, and are features that can be most readily reproduced in porcelain.

The filling or crown with beautiful borders and good point of contact only, that once won unqualified approval, becomes the eyesore and you are anxious to get at it, regardless of the fact that it is "sticking and preventing decay," in order that your ideals brought about by your new conceptions of perfection, may be realized and a useful as well as beautiful restoration take its place. One should feel no hesitancy in removing any kind of a crown or restoration that is not rendering the maximum amount of efficiency. Such an act

could not be construed as a reflection on the first operator, who, in many cases, will be yourself. The satisfaction of the patient, who recognizes immediately the sharpness and cleanliness, will repay you for the stand you have taken. The patient can then "Fletcherize" without tiring every muscle associated with mastication, and finally giving up by bolting the food as before. These corrections have all been made possible by the use of the gold casting, and to a very large extent the alloy filling; but porcelain, a material that cannot be cast and a material that too few of us rely upon, apparently, could not be utilized for definite surfaces until some definite technic could be worked out. It is recognized that beautifully carved porcelain occlusal surfaces are often presented showing the sulci fossa, grooves, and even the wrinkles wonderfully carved, but seldom definite so far as occlusion of cusps and planes is concerned. In explanation it is held that the shrinkage of porcelain, together with off-hand technic, form a combination that makes definite planes and triangular ridges impossible so far as perfect occlusion, without grinding, is concerned.

Perhaps the most beautiful porcelain bicuspid and molar crowns that have ever been shown or will be shown are off-hand carved crowns, but the fact remains that their occlusal surfaces relative to the occlusal surfaces of the teeth of opposing jaw in which they are to fit, are not definite. It is hoped that the description of technic to be presented tonight will help to solve this question of definite occlusal surfaces in porcelain crowns.

Porcelain baked crowns with definite occlusion are seldom seen in the mouth, for the reason that up to a comparatively short time ago no technic had been employed to remedy the conditions. Porcelain inlay restorations involving one-half or more of the occlusal surface in correct occlusion are never seen in the mouth. They are beautiful, it is true, with their shadings, beautiful borders, etc., but aside from "sticking and preventing decay" they, like other fillings, must be considered in the light of failures if we are going to take correct tooth form as our standard. There is no desire to criticize the different degrees of perfection that have been the goal in the past, but in view of recent conclusions a higher degree of perfection and usefulness has been accepted as standard, and judgment is offered accordingly.

Now if we can produce a posterior porcelain jacket over a metal core that has strength, durability, perfect contours and presents absolutely no surface that the most exacting periodontist can complain of and with it all have the occlusal surfaces and planes riding over each other, producing a most complete state of masticating efficiency, we have the ideal individual crown for posterior teeth as well as anterior.

For many years only the individual artists have indulged in the pleasure of successfully making and adapting porcelain jackets for the reason that no definite technic simple enough for the average good practitioner, had been devised that would enable them to take it up with any degree of confidence.

The individual artist needs no definite technic to produce beautiful results. He is one man in hundreds, but the average man needs definite rules to follow, and if he follows them carefully and persistently, he, too, oft-times becomes the artist.

The technic here offered is definite enough, so that it is possible to make a number of crowns on the same model and have them all alike absolutely, interchanging on the models and in the mouth without grinding the crown in any way after the final bake.

The advantage to the operator of average ability who has hesitated doing this work because he had thought it the work of the individual artist, is obvious. Most any careful man can do this work well, but it is only reasonable to suppose that, even with the same technic, all operators cannot achieve the same results or degrees of perfection, for a crown depends upon the individual artist for its degree of beauty and upon the mechanic for the three most essential qualities of any porcelain restoration, namely: approximation, occlusion and adaptation.

Approximation, occlusion and adaptation cannot be accomplished without definite technic, and definite technic demands exactness in every stage. Perfect preparations, accurate impressions, models that cannot be criticized, articulated casts as faithful as mechanical appliances and care can produce, together with a fair amount of skill are the foundation, absolutely necessary, upon which we are to produce certain fixed results. Average models, average impressions, in fact average procedures are not enough to produce constantly definite results. The preparation of vital anterior teeth for the application of the all porcelain jacket crown has been so often described and written of, and the methods used by different writers and clinicians are, in the main, so much alike, that aside from a few pertinent points we will dismiss this part of the subject to take up the field of posterior porcelain crown constructions and their anatomical occlusions.

Since Spaulding, of Detroit, suggested some twenty years ago the shoulder preparation for the so-called Land jacket, the object of the jacket porcelain crown, the preparation of teeth for same and the appearance of the final result, have not changed in all that time. The original technic employed by Land and Spaulding had not been changed or improved upon until within the past few years. Several men, among whom are two Chicago operators of exceptional ability



—Schneider and Thompson—have come forth with much that is of real value in the way of technic.

Some objection has been raised to the use of anaesthetics in any form, claiming that often it is contra-indicated, and giving as a reason that the tooth might become overheated, with resulting hyperaemia, inflammation, and consequent pathologic conditions. I wish to take this opportunity to go on record as emphatically advocating conductive and infiltrative anaesthesia in this work. This decision has come after a fair trial of all methods, starting with cold water, then body temperature water and finally, on the suggestion of a very competent man, hot water was used with fairly good results. I am not prepared to condemn any of these methods simply because I get better results with something else, but I am convinced that Apothesine or procaine, used either conductively or in infiltration, in my hands at least, is capable of most gratifying results. My observation has been that the pulp becomes devitalized as a result of improper care of the tooth immediately following preparation more often than any traumatism of stone owing to inability of the patient to sense approaching pain on account of anaesthesia. Improper preparation, shock, etc., is just as possible, if not more so, without anaesthesia as with it. The preparation under anaesthesia should be with the aid of a constant stream of body temperature water. Stones and instruments should be at about 100°, and at no time should the preparation be executed without the constant stream of body temperature water.

Understand clearly that time is a very important consideration in the preparation of vital teeth for this work. I am not impressed with speed in this operation, and while it may in a way indicate one's skill, it generally ends in doing the tooth much more harm than good. Careful preparation makes perfect preparation where possible, and upon perfect preparation only can we hope to build and produce perfect results. Personally I have never seen fine preparations executed in the mouth in a hurry. If you are a rapid operator, take an hour to prepare a case, and if you are a slow operator take much longer even though you could do the work in thirty per cent. less time, for the reason that the tooth is subjected to less heating and less possible shock of any kind. The shoulder should be flat and slightly declined from periphery of preparation, toward apex of tooth. This results in a stronger and better defined shoulder in the finished work. The angle at periphery of preparation should be sharp and well defined, using small hoe chisels for this purpose as a final procedure to render smooth any little rough surfaces left by burr. A radiograph is necessary to determine position of pulp and any enlargement that might be present. The preparation should approximate the general shape of original tooth, and the space between preparation and articulation should have special attention.



The vital tooth should now be varnished with at least two coats and hardened with warm compressed air, so that no shock may come to pulp in taking impressions. After impressions, bite, etc., have been taken, the next step is to send patient home with the appearance of mouth in a fairly presentable condition. The tooth is given another coat of varnish, hardened with warm air, and a celluloid tooth form or half of gelatin capsule fitted to tooth at gingiva by slitting the form on each side and twisting copper wire to slight tension around form. The form is now filled with any of the synthetic cements you may prefer, of proper shade, and quickly forced on to tooth. The twisted wire is now gently moved toward the gingiva and under the gum, twisted tight until the celluloid form makes a perfect matrix aided by the adjustment of the slits on each side. While the tooth forms on the market make more desirable contours and shapes, I prefer the gelatin capsules because they are thinner and dissolve off in the mouth about long enough after the cement is mixed to allow of proper crystallization.

Allow me at this point to register my disapproval of the use of gutta percha or any other temporary form other than here described, for the protection of tooth and forcing back gum tissue during the period intervening between preparation and cementing of finished work. In the first place, they are unsightly, but the most important objection is the unusual tension of the tissues that comes from the use of anything but a perfect fitting shoulder and tends, in a large percentage of cases, after the finished work has been in mouth some time, to produce recession and the inevitable line between porcelain and tooth, which is unsightly, however perfect.

See that the temporary work gives the same tension to tissue as the finished work, and the patient will be dismissed finally with no evidence of what has been done, other than the improvement you originally intended, and no fear on the part of the operator that subsequent recession as a result of this work at least will eventually occur. These temporary coverings should be carefully approximated and articulated and left as near the size of original tooth, so far as thickness is concerned, as possible, for in a busy practice and for reasons that even the operator is unable to explain, they are often left in the mouth for weeks, and during that time much injury could be done to the arch in some mouths if these precautions are not adhered to.

Unfortunately it is impossible to lay colors of porcelain on the anterior preparations in any other way than by spatulation or brush and produce the desired effect, owing to the necessity of portraying accurately the shades in the anterior part of the mouth. Porcelain, for maximum strength, should be packed under pressure as the manufacturer of artificial teeth does. Unfortunately we do not have the

fixed moulds, as we are dealing with individual cases, but we can resort to a matrix for posterior teeth at least, into which the porcelain can be forced and agitated in such a manner that the crystals will adapt themselves to one another as the moisture is removed, and thus occupy the least possible space, giving a stronger and more dense mass. Porcelain is much stronger than is generally supposed, and we are told that it will sustain greater resistance to compression and tension than the highest grade of dental amalgam.

Some tests for comparative strength of amalgams, silicates and porcelain teeth made by Fickes, of Pittsburgh, two or three years ago, are interesting at this time. A machine having a registry of 1,000 pounds was used and all samples contained 125 cubic millimeters. Of four high grade amalgams the general average was 678½ lbs. (24 hours' setting); of four silicates a general average of 448¼ lbs. (24 hours' setting); and of six cubes of porcelain cut from high grade porcelain teeth the general average was 942 lbs.—about 164 lbs. greater than the general average of amalgam. The last experiment was six tests of high grade porcelain for inlay work, which showed a general average of 716 lbs., or about 38 lbs. general average greater than the amalgams.

These tests are illuminating, and especially valuable in view of the fact that we are now using porcelain for jacket work that is infinitely more dense and capable of withstanding greater masticating stress. It is also gratifying to know that one's own experience with baked porcelain, properly packed, on good preparations, is verified by such tests as these.

After recognizing the porcelain jacket as the restoration par excellence for all individual crown cases, it became necessary to devise and adopt a definite technic that was simple and teachable, and which, when once mastered, could be applied exactly the same in all cases. I have elected to show the technic for posterior teeth to-night and, for convenience, the case presented will be that of an inferior first molar, starting the description with the roots of the molar already filled. Bulging surfaces of remaining portion of natural crown, if any, are ground to get measurement of root; two copper bands are made and festooned to fit roots, and then filed away in an envelope with patient's name. There are several methods or means of getting the impression of root, all of which seem to have their advocates. The copper cup has not been successful in my hands, and up to a short time ago I found the extra long thin bands of copper most desirable. About a year ago one of my associates suggested the wings I am showing in this slide, having seen it in some clinic. The exactness of this form of matrix appealed to me at once, and I feel that it is most humane, the wings allowing the band to go up under the gums and no farther. Any method that depends upon first fixing the band

in position and then pushing the modelling compound through the top of same is bad. If the copper bands are not fitted before excision of the natural crown, an opportunity to avoid contusion of tissue and consequent pain to patient is overlooked. All remaining portions of natural crown are excised to natural enamel line or well under free margin of gums, care being taken to avoid any injury to the gingival tissue. The pulp chamber is now squared up and canals opened up a short distance, as nearly parallel as possible. It is necessary to have the combined axial length of the box-shaped pulp chamber and the canal preparation about one-fifth greater than the height of core which extends out of root and upon which the jacket is to be built—to give adequate strength and qualities of retention. A wax core is made, allowing for a very narrow shoulder and reproducing shoulder in wax where decay has extended far below or above, as the case may be, the natural enamel line. If there be much loss of tooth substance extending apically under the gum line it is well to make the core by the indirect method. This is accomplished by filling the canal preparations with compound, inserting small brass brads or screws that extend out of canals in to pulp chamber, and when the impression is taken with copper band in place the whole is engaged and a perfect impression of canal preparation, pulp chamber and root end, all in one, is the result. The wax core, which is the pattern for the metal core, should be so carved as to take into consideration the height and general contour relative to distribution of porcelain mass for maximum strength; as for adaptation of the metal core, I am convinced that the indirect method is the better. The core is cast and cemented to place. The bands are now taken from file, having been previously fitted and festooned, and it is determined whether one or two impressions shall be taken. If the patient is a youngster and the tooth is being crowned because of some neglect while orthodontia bands were being worn, etc., it is necessary to preserve the space absolutely, and, therefore, a jacket of cement is indicated that will give the correct stress to tissue and retain the proper distance between the two approximating teeth. In case, for example, two impressions are taken, one of which is used for the preparation of an amalgam model, and the other for a cement model which is made immediately while the patient is in chair, and on which a tin matrix is made as base for a cement jacket, which retains tissue tension and approximates contact, but without occlusion.

#### REPORT OF MEETING.

PREPARED BY E. A. GRANT, D.D.S., TORONTO.

**F**OLLOWING his paper, Dr. LeGro gave a talk on his technic, illustrating the different steps by a series of slides. He explained that the subject could not be covered in one evening; in fact, to properly teach the technic would require about a two



weeks' course. However, he briefly ran over his method of constructing a jacket crown for a molar tooth, and then one for an anterior tooth. It had been found not practicable to put a porcelain jacket or veneer crown over vital molar teeth, so that, where necessary to preserve vitality, some other means must be used. To make one of these crowns for a non-vital tooth, the root was ground flat at a level about 1 mm. below the gum line, the pulp chamber squared off, and the canals enlarged for a short distance. A mass of inlay wax was then softened in water about 120 degrees and forced over root end with considerable pressure, and a hot instrument used to melt wax in centre, thus ensuring its running down into enlarged portion of each canal. The wax is then trimmed and cast, thus providing a metal core, building up the root and leaving a definite shoulder, which is cemented in position, and on this foundation a jacket crown is constructed by the indirect method. Without seeing the slides, it would be difficult to understand the many splendid ideas evolved by the essayist for precision work in the indirect method. Impression of root was taken by copper band and compound, and amalgam model made according to the most approved methods; giving what Dr. LeGro terms the minor model. The method used for obtaining a major model, with the minor model correctly inserted in it, was most ingenious. The stem of the minor model is trimmed and the base keyed, tinfoil is quickly burnished over the form to make a coping, and this covered over by a thick layer of cement. When the cement is set the coping is removed from the form and placed on the tooth in the mouth, wet absorbent cotton is packed at gingival between this coping and approximating teeth, also into any under-cuts which are unnecessary to reproduce, as modelling compound will not flow wherever wet cotton is placed. An impression is then taken, and coping comes away with it. The amalgam form or minor model is placed in the coping, and can be seated exactly to position. Dr. LeGro fills the impression of approximating teeth with Oxyphosphate cement, setting brads or wires into the cement for retention to rest of model. Plasticine is also placed on buccal side of stem of amalgam form, to facilitate lifting it out of model, and remainder of impression filled with plaster or stone. Compound impression is also taken of opposing teeth, and this filled with Spence metal, care being used to have impression well oiled, and to remove Spence metal as soon as it shows signs of crystallization. If left too long, removal would be difficult, or almost impossible.

The ordinary wax bite was not accurate enough to meet Dr. LeGro's requirements; instead, tinfoil was burnished over teeth of each model and stiffened by flowing sticky wax along buccal and lingual surfaces. These caps were then fitted in the mouth, and with the teeth in correct occlusion, were united together by means of more sticky wax. They were then waxed to the models and mounted



in the articulator. Dr. LeGro then went on to describe the making of the platinum matrix or coping. The amalgam tooth form is removed from the major model and a strip of platinum considerably wider than the height of the tooth and long enough to wrap around it is placed on the form, holding it at one side with the under finger and keeping the edge below the shoulder; it is then gently wrapped around with the fingers, taking care to not use too much force or to put the platinum under tension. The shoulder is then outlined with a hard polished orange-wood stick, such as the drug stores sell for manicuring purposes. The matrix is then opened up and the excess height trimmed off, except on one side, where sufficient excess is left for an occlusal apron which can be bent over to cover occlusal surface. The sides are then wrapped around again, the burnishing completed, and the joint sealed by crimping the ends over in what is known as a tinner's joint. The extra thickness of this tinner's joint at the shoulder can be obliterated by small jeweller's needle files, which are the finest and most delicate instrument that could be used for this purpose. The platinum foil is never annealed at any stage of the burnishing. The platinum coping being completed, the case is now ready for the porcelain body. By Dr. LeGro's technic, the porcelain body is so densely packed into a matrix, and dried so thoroughly, that he secures a block which is about the consistency of chalk, which may be handled, and all the fine carving of surfaces, contact points, marginal ridges, triangular ridges, sulci, etc., sharply outlined, thus removing one of the chief objections to porcelain work in the past, viz., the difficulty of obtaining correct anatomical form. To do this, one thickness of sheet wax is wrapped around stem of amalgam tooth form, being trimmed to a sharp edge, just at shoulder. Paper is then wrapped around this to extend higher occlusal surface of finished crown. This provides a box into which porcelain body may be packed, and which is made sufficiently over-size, by the layer of sheet wax, to provide for the contraction of porcelain on baking. The porcelain body is packed into this, and well condensed by sticks of as large a diameter as may be used; moisture is removed by means of pencils made from plaster of paris. When the matrix is filled, it is agitated for a considerable time, and pressure exerted with a napkin, so that moisture may be removed, and the mass condensed so that the crystals are in very close relation to each other. If properly done, it will be found, when the paper and wax band are removed, that the porcelain body can be handled with impunity for the necessary carving. It would be impossible in this brief resume to describe in detail the selection of the different bodies for shade, etc., or the complete baking of the crown. This could only be done by means of an extended laboratory course.

In describing the preparation of a jacket crown for an anterior vital tooth, Dr. LeGro described, in detail, his method of removing

the enamel. He claimed that absolutely all enamel must be removed from the crown, not even leaving any for a shoulder. He gave it as his belief that the shoulder should never rest on enamel, that under the continual impact the tooth receives in mastication, the narrow ledge of enamel would soon be knocked off. To remove the enamel, cuts were made with Joe-Dandy disk on proximal surfaces, to gingival line, removing all the enamel on these surfaces with the one cut. The labial plate was cut into checkerboard squares, making grooves completely through enamel with small knife-edge-inlay stone, kept cool by a continuous stream of body temperature water. Lingual plate cut in same way with stone kept cool by compressed air. The squares of enamel are then easily removed by a Case cleaver, or instruments especially designed for this purpose by Dr. LeGro. The gingival ledge of enamel is also removed by cleavers, and when the tooth is completely denuded, a shoulder is cut with very fine fissure burs which do not cut on the end. Impression is taken by means of Blue Island copper cone of proper size, filled with compound. The impression is filled with silicate cement, instead of amalgam, for greater speed; the silicate is formed into a rope and packed quickly with great pressure, using sticks as large as possible. Owing to the lateness of the hour, and to the fact that Dr. LeGro had to catch a train that night, he could not present more of his subject, nor was there any discussion. Dr. Gordon McLean, in a few timely remarks, expressed the appreciation of the Society, and said that Dr. LeGro's methods and technic were so complete that there was really nothing for him to criticize. The hope was expressed that Dr. LeGro might return next fall, and give a short laboratory course in the construction of these jacket crowns, which seem to be the most perfect form of restoration which, in the light of our present knowledge, can be put into the mouth.

---

### Report Governing Interpretation of Income Tax Regulations as They Apply to The Practice of Dentistry

---

LETTER FROM DR. S. G. MCCAUGHEY.

384 McLaren Street,

Dr. Wallace Seccombe,  
Editor Oral Health,  
Toronto.

Ottawa, March 24th, 1921.

Dear Doctor,—Mr. Breadner, Commissioner of Taxation, who had promised to be with and address the Ottawa Dental Society on Monday, March 21st, was unable to be present, owing to the fact that the "Consolidation" of Income Tax was before the House that night.

Mr. C. Fraser Elliott, solicitor to the Department of Taxation, came in Mr. Breadner's stead and gave a most instructive address. Mr. Elliott, by virtue of his position, really gives the final ruling on the matters we wished to bring before him.

Mr. Elliott is no stranger to Dentistry, he has three brothers practising. He gave a most delightful historical sketch of Income Tax Acts in the British Isles, United States and Canada since its inception in Britain in 1842 following the Crimean War, in the United States in 1863 following the Civil War and in 1917 in Canada during the late Cataclysm; showing the reasons for its necessity, the various and many changes necessary in the act, and the comparative results, which show the greater simplicity and leniency of Canada's act.

He then took up the Income Tax form showing that if each question or item is taken in its turn and answered that one cannot go wrong, provided the "whole truth" is told; emphasizing the absolute necessity of declaring your whole income, making your claims for deduction afterwards; and pointing out that it is best to declare on a cash basis, as the accrual basis requires more book-keeping and arrives at the same results.

It might be well to point out as separate items, his rulings.

No expenditure is allowed which is not directly for the production of income.

There is no interest allowed on Capital.

Brains, hands, eyes, personality and Health, being our Capital, no interest is allowed on money spent to acquire and maintain these. This money is regarded as an investment in Capital Stock.

If money is borrowed to pay for the equipment, interest is allowed on this borrowed money until it is paid back.

There are two classifications of income, Main and Secondary.

Dentistry being our main income, that income *cannot be reduced* by losses sustained in transactions not connected therewith.

Secondary income, from Stocks, Bonds, rentals, etc., can be reduced by offsetting such income by taxes and carrying charges paid out in respect of the revenue and non-revenue producing property.

If a "flyer" be taken in real estate or Bonds occasionally, the profit from that flyer is not regarded as income but goes into Capital Stock, nor can the loss from these "flyers" be classed as expenses and deducted from your Main Income. If your "dabbling" assumes such proportions that you may be said to be engaged partially in that line of endeavor your income from these is regarded as part of your secondary income.

The Department takes the ground that they care not where your



income went, you had such and such an income and are taxable on that *amount*.

The matter of striking a flat rate of 50% receipts as expenses was brought up and advised against on the ground that it really was class legislation and that all callings would have equally as good a right to ask for a flat rate, for example, the farmers might ask that the earning power of an acre of ground be declared and then they would base their income on that amount multiplied by the number of their acres.

Mr. Elliott here cited the case of western farmers who might incur heavy expenses in sowing this year's crop and obtain no grain and incur the same amount again next year and get a crop, on which they paid income tax deducting that year's expenses only.

In making up your summary put in your whole income, make your total deductions, deduct the exemption of \$2,000 for a married man and \$1,000 for a single man, and strike the tax payable on this amount; if income be below \$5,000 it is 4% of the amount; over \$5,000 the rate is stated on the Income Tax Returns sheet.

From this amount deduct \$8 for each dependant child under 18 years of age or each child of your own under 21 years of age if mentally deficient, or \$8 for each dependant parent. Unfortunately no provision is made for mentally deficient dependants other than these.

The tax is payable in full April 30th, but may be paid in installments as provided in the act.

Any excess tax paid will be returned to you.

Any insufficient tax payable bears interest on the amount of the discrepancy at the rate of 6% per annum from April 30th to the time of payment.

If you live and practise in the same house or apartment you may charge up a proportionate amount of the rent, gas, electricity, etc., based on the proportionate amount you use as your office in its relation to the whole area.

I think you will agree with me that the address, questions, and explanations were really most exhaustive and that Mr. Elliott's presence, ability and desire to be of service to the Dental profession in clearing up these difficulties are much appreciated.

I have submitted this, my report of the meeting, to Mr. Elliott who has very kindly verified the presentation of his rulings and am sending this report to you so that if you deem it advisable it may be passed on to the profession.

Faternally yours,

S. G. McCAUGHEY.



## LETTER FROM SOLICITOR, TAXATION BRANCH.

Ottawa, April 2nd, 1921.

S. G. McCaughey, D.D.S.,  
384 Maclaren St.,  
Ottawa.

Dear Dr. McCaughey:—

I regret that your letter of the 26th March has been unattended to up to this date but the pressure of business has not permitted my giving it earlier attention.

In view of the fact that you are going to report to the Canadian Dental Association and to two Canadian Dental magazines, the substance of my address to the Ottawa Dental Society on Monday, March 21st, I am taking the liberty of recasting some of the topics dealt with in your letter to Dr. Wallace Seccombe. I would respectfully suggest that they be used in amplification of your letter.

The Amendments to the Income War Tax Act of 1917 and the absence of comprehensive published rulings made under the provisions of the said Act have left the Dental profession in no more of a quandary as to what their duties are than many other classes of persons. In order to bring to your attention in as concise a manner as possible, the essential sections of the Act are dealt with, only in language which may be termed anything other than "statutory."

Section (4) renders liable to taxation all persons resident in Canada or carrying on business in Canada. Consequently individuals engaged in the practice of dentistry must procure on their own volition Income Tax Forms known as T 1 from the Inspector of Taxation for the District in which they reside or from the local Postmaster. This Form must be completely filled in and delivered to the Inspector of Taxation for the District in which you reside on or before the 30th day of April, 1921.

The first page of the form can be filled in easily. Simple questions of fact only are asked which have no relation to income.

On contemplating page two do not attempt to comprehend the whole page at a glance. If such is attempted the words "gross income" at the top of the page seem in conflict with the words "total income" at the foot of the page. Rather, contemplate each numbered item on the page as you would contemplate the questions on an examination paper. In filling in page two there should be, at least mentally, blazoned across the whole page the statement "declare the whole truth and nothing but the truth." The purpose of this page is to secure from you a declaration of your income from every source without any consideration whatsoever of deductions. The deductions will be taken care of later on. It cannot be impressed upon you too much the necessity of stating accurately your total income from all sources. If this page should be incorrect by a

deficit of over 10% of the true amount of your total income there is automatically taken, by the provisions of the Act, 50% of the unstated amount; while if the statement on page two should be incorrect by a deficit of 20% of your total income, the total amount of the deficit, not the tax on the deficit, but to repeat, the total amount of the deficit, is taken by way of penalty.

Proceeding to page three of the Form. You may thereon claim whatsoever deductions you feel should be properly allowed you as incidental expenses necessarily incurred to earn your income. It is to be remembered that expenses necessarily incurred to earn the income are the only expenses allowed by the Department as deductions. Personal and living expenses are but an application of your income and not allowed as a deduction.

In claiming deductions it must be borne in mind that for purposes of taxation you are in receipt of two classes of income, primary and secondary. The primary income may be said to be that income received by you from that productive work continually and habitually carried on, forming the foundation of your financial standing in the community. Secondary income may be said to be that income derived from sources other than your fixed occupation, trade or profession. Your fixed occupation is the practice of dentistry. From the gross income received in following this profession you are only entitled to deduct expenses necessarily incurred to earn that particular income. Expenses incurred by dentists in earning income from sources other than their profession can only be deducted from the income so earned. If these expenses exceed the income from secondary sources the excess of the expenses are not allowed as a deduction against the income received from the practice of dentistry. Consider this well when completing page three and first from the gross income from professional fees deduct only expenses necessarily incurred to earn such fees. And second, of the total deductions otherwise claimed, deduct them from the income shown as having been received from sources other than professional fees. The summation of the result of the two cases gives the net income in respect of which the taxation provisions of the Act apply.

From the net income just referred to, the taxation provisions of the Act permit of an exemption of \$2,000, in respect of the following persons:

1. Married persons.
2. Persons who are supporting a dependent brother or sister under eighteen years of age or a dependent parent or grandparent.
3. A widow or a widower with a dependent child of his own parentage under twenty-one years of age or over twenty-one and dependent on account of mental or physical incapacity.
4. Corporations.

Any person not in any of the above classes is entitled to an exemption of \$1,000 only. There is a further exemption provided for by the Act of \$200 for any child irrespective of parentage, under eighteen years of age, who is dependent upon the taxpayer for support.

After these exemptions have been taken from the net income, the balance remaining is subject to what is known as normal rate of tax, that is four per centum of the portion of the income above the exemptions referred to up to \$6,000 and eight per centum on all incomes above \$6,000. Then follows on incomes of \$5,000 and above the taxation rates known as the surtax and additional tax.

Finally it is to be noted that when filing the return there must be paid at least one-quarter of the tax as estimated by you, otherwise penalties may be incurred. The remaining three-quarters may be paid in bi-monthly instalments, on the 30th June, 31st August and 31st October, respectively. I would strongly advise payment of the total amount of tax as estimated by you at the time of filing the return. This will avoid the necessity of you keeping track of the dates at which instalments are due. Subsequently you will receive an Assessment notice from the Department altering or confirming your estimation of the tax, also acknowledging receipt of payment made and assessing for any undeclared balance, which must be paid within thirty days from the date at which such assessment notice was addressed to you.

I cannot too strongly bring to your notice the fact that if a person conforms to the following simple requirements he will not be subject to a single penalty.

1. Declares his total income.
2. Files his return on or before the prescribed date.
3. Pays on filing one-quarter (or more, preferably) of the tax which he himself estimates to be the correct amount.

If you find it difficult to estimate your tax, put on your return as your estimation, the amount of tax paid for the previous year and pay on same as suggested.

There is nothing difficult in complying with the requirements. This latter statement is about as honest as the Dentist himself makes when he is about to draw a tooth. "This will not hurt you." The tax collector says on drawing the money out of your pocket, "This will not hurt you."

Now to answer your questions as to whether the outlay in respect of the following items will be allowed as a deduction from the gross income received due to the practice of dentistry.

Rent and heat .....	Allowed
Janitor, light, power, gas and water (if included in your renting contract) .....	Not allowed



Supplies, drugs, precious metals, etc. ....	Allowed
Assistants' salaries .....	Allowed
Office telephone .....	Allowed
Laundry .....	Allowed
Uniform costs .....	Allowed
Stationery, printing, postage, etc. ....	Allowed
Magazines and periodicals, if used within the year .....	Allowed
Library actually in use in the practice... 10% depreciation allowed	
Laboratory charges .....	Allowed
Borrowed money used in business .....	Interest allowed
Depreciation of equipment .....	10% per annum allowed
Specialists' equipment of perishable nature or short lived.....	
..... Special depreciation may be allowed (e.g., X-Ray machines 20% per annum)	
Small instruments having a life of one year or less, the cost may be allowed.	
Business tax or property tax on part of property used...	Not allowed
City, provincial and Dominion income tax .....	Not allowed
Donations and office philanthropy .....	Not allowed
(last two regarded as disposition of income)	
Expenses to dental convention and Society fees .....	Not allowed
(regarded as addition to capital)	
Fee to society which gives license to practice .....	Allowed
(e.g. Ontario annual fee to the R.C.D.S.)	
Fire insurance on equipment .....	Allowed
Life, sickness, accident insurance .....	Not allowed
(regarded as personal expenditures)	
Money derived from life, sickness or accident insurance exempt from taxation.	
Professional liability insurance .....	Not allowed
Monies expended in defence of suits for malpractice or adverse judgments paid.....	Costs of the action paid will be allowed
Auditing, collecting and bookkeeping expenses.....	Allowed
Decoration of office and repairs to office (if paid by dentist)	Allowed
Alterations to office .....	Not allowed
(regarded as additions to capital expenditures.)	
Transportation charges .....	Not allowed
Interest on monies expended for education.....	Not allowed
Interest on monies expended for equipment.....	Not allowed
(depreciation is given)	
(regarded as capital investments)	
Bequests not regarded as income may be subject to succession dues, but not to income tax.	

If there are any other questions dealing with special cases they should be taken up in the first instance with the Inspector of Taxation,



who will forward any recommendation in respect thereof to the Head Office at Ottawa.

Yours truly,

C. F. ELLIOTT,

Solicitor, Taxation Branch.

P.S.—Dentists may report on an actual cash receipt basis or on an accrual basis. The former is possibly the more simple, but the latter, if a proper set of books is installed, is certainly more scientific, and will prove of real value to the practising dentist. C. F. E.

## The Fate of the First Molar

BY HARRY B. BUTLER, DIRECTOR OF MOUTH HYGIENE, UNIT  
No. 1, UNITED STATES PUBLIC HEALTH SERVICE.

NO close observer of human dentition can fail to be impressed with the part in human economy played by the first, or, as it is often called, the 6-year molar. This particular tooth differs from the others in many points. Not only is this the first of the permanent teeth to make its appearance, but it is the largest of the teeth. It differs from those that have thus far appeared in that it is not replaced by any other tooth and it does not replace another. However, this tooth is to play a very important part in dentition, as it must sustain the stress of mastication during the period in which the temporary teeth are being replaced by the permanent teeth, and it also largely determines the position of the permanent teeth which follow it in normal dentition.

The first or 6-year molar has developed under somewhat different conditions from those of any that have appeared before it, and it is to be subjected to a different environment. Considering the part it should play in years to follow, its loss can be regarded as nothing short of a calamity; yet, as proved by statistics, we find it to be the tooth most frequently carious, the one most neglected, and the one most frequently lost.

A somewhat exhaustive study has been made of this first molar by the field unit of the United States Public Health Service, and many interesting facts have been revealed. In this study some 6,388 mouths were examined. These were about equally divided between the sexes, 3,232 being males and 3,156 females. In age, these children ranged from 6 years, or the year of the first molar's appearance, to 17. In other words, the first 10 years of the life of this molar have been considered.

During the first year after the eruption of the first molar, caries is found to be frequently invading it. We found this condition progressing in 4.8 per cent. of all the first molars in the 6-year-old chil-

dren examined. This means 4.8 per cent. of *all* the first molars. The percentage of children having one or more carious first molars at this age was 14.3 per cent. The difference shown between the sexes at this age gives a slightly better condition for boys, the exact percentage of caries being 16.1 among the girls and 12.5 among the boys, an advantage which does not appear at some subsequent ages. It is interesting to note that the largest percentage of carious first molars among boys occurs at the age of 10 years, the same condition occurring among the girls at the age of 9. (None of these figures shows any relation to such molars as have been lost or subjected to any reparative procedures.)

These figures certainly furnish food for thought, if, indeed, they are not to be considered alarming. With this percentage carious during the first year of the existence of this tooth, fully erupted, it must be admitted that here we have one of dentistry's greatest problems. Compared with the time and thought devoted to operative work, preventive dentistry may be said to have received no attention whatever.

What becomes of this tooth which shows carious areas at so early a period? At the age of 11, or five years after its eruption, 9 per cent. have been extracted, or appear as necrosed roots only. Fifty-four and one-half per cent. of the children examined at this age showed one or more of these teeth missing or defective, regardless of such cases as had received professional aid.

Let us look at this tooth after another five years. We now find dentistry meeting the situation to a more satisfactory degree, and there is shown an increase in the percentage of lost or hopeless of but 4.7 per cent.

In order that there might be a better understanding of existing conditions regarding caries of this tooth, 1,000 cavities were carefully plotted as to location. It had been thought that its environment might have much to do with the loss of this tooth. For this reason the 1,000 cases were selected as to age, and only children from 9 to 12 were considered, for the reason that during this period this molar would have no tooth contiguous to it upon the distal surface, while upon the mesial surface it would be adjacent to a temporary tooth, in many cases carious. The following findings were thus obtained.

Occlusal cavities .....	877
Mesial cavities .....	110
Distal cavities .....	8
Buccal cavities .....	3
Lingual cavities .....	2

---

1,000

That so large a proportion of cases exist in which caries attacked the occlusal surface of this tooth, and at so early a period of the

tooth's erupted existence, leaves but one cause to be ascribed, namely, faulty development. This is found to be of somewhat different character in the varied cases.

In some cases there seems to have been a faulty or incomplete calcification of the enamel at the sulcus, with a rapid onset of caries following. In other cases we find that the enamel formation has been arrested, with little if any deposit of this protecting tissue at this point, and first indications of caries have been noted before the tooth was fully erupted.

Another form of faulty enamel has been observed, and this not infrequently. A tooth may be considered as composed of one or more lobes, with the enamel formation first appearing at the incisal edge or at the cusp tips. In multicusped or multilobed teeth, like a molar or bicuspid, the enamel formation, starting at two or more points, progresses until the advancing areas of formation merge one into another. Whenever these advancing areas merge upon a convex surface, definite union occurs. However, this formation in many cases appears to have developed in each lobe of these teeth separately as though no other lobe existed. Here it may be seen that the enamel has been deposited upon the various lobes as upon the anterior teeth, with the enamel rods tending to assume position perpendicular to the areas of the dentine which they are to cover. Thus developing, two of these areas arrive in their development simultaneously at a sulcus. Here we find at times that the relative position of the enamel rods as they join each other is quite different from the relation of those where the approaching areas have met upon a convex surface. Here the interprismatic binding substance, or cementum, fails to produce definite union between the ends of these rods as it does when they approximate each other along the line of their main axis, and a faulty union between the merging areas results.

With any of these types of faulty development present, and with the sulci forming favorable locations for the retention of food debris, and because of the increased colonies of bacteria here located, owing to lack of abrasion in the process of mastication, caries rapidly develops. This is also noticed in the smaller sulci upon lingual and buccal surfaces, but in correspondingly less degree, as evidenced by the finding of but five cases in 1,000 of these two areas combined, as compared with 877 found in the occlusal sulci. (The frequent appearance of caries as a result of faulty development at these points may be viewed as a process of involution which human teeth are undergoing, as modern food and culinary methods render their use less essential.)

While the teeth of children with marked malnutrition show a large percentage of caries, these occlusal cavities appear in the teeth of children of vigorous health as well as in those of the undernourished. This dental defect is also noted in bicuspids and other molars, but it is in the first molar that it is most conspicuously noted.



Among the common direct causes of dental decay there should be recorded an inherited tendency to dental caries. Also we find faulty diet and lack of rational mouth toilet frequent factors. These factors being true in all cases of caries, must of necessity apply also to the first molar.

It will appear that to undertake any preventive measures toward the improvement in condition of the first molar means measures that will successfully combat the process of involution, which all authorities agree that the human tooth is undergoing. This would seem a hopeless task, necessitating the eating of coarser food and more vigorous use of the teeth generally.

Certain general measures should be adopted. As early as the tenth week of fetal life the development of the dental organs may be found, and a well-balanced diet for the mother will be as beneficial to the teeth as it will to the development of other calcific tissues; and the same will hold true regarding the diet of the child during its first years. Prophylaxis is of especial value to the younger children; but it is evident that in some corrective measure lies the chief hope for a long period of usefulness in the case of the first molar.

It is found that the greatest number of first molars are lost from one of two causes—either the parent fails to recognize this important tooth as a permanent tooth, or else the fear of the dental chair upon the part of the child is such that any early treatment will not be obtained. To obviate the former condition, educational measures are clearly indicated; and in the matter of fear of the dentist, much may be done.

There is no single point in which dentistry falls so short of the mark as in the successful treatment of the temporary tooth; and the fact that it will be eventually replaced by another tooth seems to many dentists to justify its total neglect. Much advancement in dental science must come, and with this, early visits to the dentist by these little citizens. By careful treatment, confidence in the operator must be obtained and fear must be dissipated. Then, with these early visits, the first signs of caries in the first molar may be detected; and only by most painstaking operative procedures may this tooth be preserved for the required years of usefulness.

---

### Dr. Al. Moore Exonerated

---

THE many friends of Dr. Al. Moore will be glad to learn that he has been honorably acquitted of any responsibility in connection with a case reported in the press some months ago, the Judge stating that the charge should never have been laid.



# Canadian Dental Association

TENTH BIENNIAL CONVENTION, OTTAWA, CANADA.

DAILY MINUTES OF PROCEEDINGS—FIRST SESSION.

THE tenth biennial Convention of the Canadian Dental Association was called to order at 2.30 p.m., Tuesday, August 17th, 1920, in the Normal School Building, Ottawa, the President, Dr. Frank Woodbury (Halifax), presiding.

On motion of Dr. Black, seconded by Dr. A. E. Webster (Toronto) the printed programme as placed in the hands of members upon registration was officially adopted.

The Secretary (Dr. Bradley) read a telegram from Dr. F. H. Garvin, Winnipeg, expressing regret at his inability to attend the Convention and extending his best wishes for a successful meeting.

The members were welcomed to Ottawa in an address by Mr. Harold Fisher, Mayor of the City, which was responded to by Dr. A. W. Thornton (Montreal).

The Vice-President took the chair while Dr. Frank Woodbury delivered the President's address; which was duly adopted and referred to the proper Committees, subject to adoption of proposed new by-laws.

The meeting extended an official welcome to Prof. Luis Subirana, of the Dental School of Madrid, Spain, by rising in a body. Prof. Subirana was invited to a seat on the platform.

Dr. Clarence Grieves, Baltimore, addressed the Convention on "A classification of teeth, the tissues of which might be infective local or systemic factors." Discussion was participated in by Dr. McDonagh, Toronto, and Dr. Seccombe.

On motion of Dr. Seccombe, seconded by Dr. Webster, the report of the Committee on Constitution and by-laws was unanimously adopted. The following members were thereupon elected to the Executive: Dr. Wallace Seccombe, Dr. Jas. M. Magee, Dr. Gordon McLean, Dr. Nolin, Dr. George Bush, Dr. Hodgson, Dr. Allan Strang, Dr. A. E. Webster, Dr. Thornton, Dr. Beauchamp. It was announced that the following members had already been elected from their various societies: Dr. Conboy, and Dr. Bothwell, Ontario; Dr. Clay, Alberta; Dr. Jones, British Columbia; Dr. Bagnall, Prince Edward Island; Dr. Larseneur, Dr. Gauvreau, Quebec.

The Secretary presented the financial report, motion for the adoption of which was duly seconded and carried.

The Secretary presented report of the Executive Committee, as

follows: At the Chicago meeting Ottawa was selected as the place of meeting for 1920. The Constitution was adopted and a committee was charged with the framing of by-laws. These appeared in the Dominion Dental Journal of which every member got a copy this morning. In January, 1920, an Executive meeting was held in Toronto and the programme for this Convention mapped out; of course, it has been considerably changed since. Yesterday afternoon an Executive meeting was held here, the constitution and by-laws were gone over and the changes which I mentioned a short time ago were suggested. Of course, these suggested changes have been rejected so that our meeting did not amount to anything. At that meeting we also appointed the Committee with regard to the Canadian Army Dental Corps. We also decided yesterday that the annual fee shall be \$5.00.

There was a motion with regard to the Miller Memorial Fund. It was moved by Dr. Jones, seconded by Dr. Black;

That the Executive of the Canadian Dental Association recommend to the Canadian Dental Association that the money already subscribed for the Miller Memorial Fund be turned over to the Canadian Dental Research Foundation, to be known as the Miller Memorial contribution; provided that all contributors who object to this may have their money refunded by the Canadian Dental Research Foundation, on request.

The adoption of the report was moved by Dr. Conboy, seconded by Dr. Nolin.—CARRIED.

The meeting adjourned at 5.50 p.m. until 9 a.m. Wednesday.

---

Wednesday, August 18, 1920.

The meeting was called to order at 9.15 a.m., the Vice-President in the chair.

The minutes of Tuesday's meeting were read, and, on motion of Dr. Conboy, seconded by Dr. Black, adopted.

Dr. T. Sydney Smith, San Francisco, gave an "Illustrated Talk on Oral Focal Infections and Their Treatment." The discussion was opened by Dr. Dubeau, and participated in also by Dr. Grieves, Dr. McDonagh, Dr. Magee, Dr. Davis, Dr. Thornton and Dr. Shantz.

An address, illustrated by slides, was given by Dr. Wallace Secombe, Supt. R.C.D.S., on "Preventive Dentistry With Special Reference to Diet." Discussion was opened by Dr. Fred Husband.

The meeting adjourned at one p.m.

Wednesday afternoon was devoted to social affairs. The Ottawa dentists entertained the visiting members and their wives to a motor drive around their beautiful city, first visiting the Parliament Buildings, then the Rockcliffe Driveway, Government Experimental Farm,

etc., and arriving at the Rideau Aquatic Club in time for an al fresco tea, followed in the evening by a most enjoyable dance.

Thursday, August 19th, 1920.

The meeting was called to order at 9.20 a.m., the President in the chair.

The minutes of Wednesday's meeting were read and duly approved.

Dr. Clyde Davis, of Lincoln, Nebraska, gave a paper on the "Histopathology of the Cementum as Related to Pulp Canal Surgery," illustrated by lantern slides. The discussion was opened by Dr. Webster.

Dr. Conboy announced for the Executive Committee that the following committees had been appointed:

Reports of Officers—Drs. Bush, Magee, Thornton.

Credentials—Drs. Webster, Nolin, Jones.

Necrology—Drs. Bothwell, Clay, Beauchamp.

The report of the Educational Committee was presented by Dr. Webster and duly adopted.

A paper was read by Dr. George Kerr Thompson, Halifax, on "Rural Health Caravans and Pre-school Age Dental Clinics." Discussion was opened by Dr. Ryan. The paper and the recommendations contained therein were referred to the proper committee.

Adjournment for luncheon at 12.40.

The meeting resumed at 2.30 p.m., the President presiding.

Dr. Webster addressed the convention briefly with regard to the "Western University," established at Chengtu, West China, for the purpose of educating the Chinese in medicine, dentistry and nursing, in their own language.

Dr. E. C. Kirke, Philadelphia, read a paper on "The Scientific Side of the Manufacture of Dental Products, Involving the Question of Co-operation of Dentist and Manufacturer." The discussion was opened by Dr. Nolin.

Dr. Abbott presented the report of the Committee on the C.A.D.C., and moved its adoption. Seconded by Dr. Smith and carried. Dr. Morrison moved that the committee continue its work in putting the C.A.D.C. on a working basis, the committee consisting of Drs. Green, Thompson, Gibson, Seccombe and Abbott. On motion of Dr. Smith, the name of Dr. Bush, of Winnipeg, was added to the committee.

The convention was addressed by Dr. Luis Subirana, of the Dental School of Madrid, Spain.

Dean Thornton, of McGill University Dental Faculty, gave a paper on "The Pros and Cons of Fixed Bridgework." Discussion was opened by Dr. E. C. Jones, New Westminster, and participated

in by Drs. Nolin and Fleming. Dean Thornton then showed some slides illustrative of his address.

The meeting adjourned at 5.50 p.m.

The Friday morning session was devoted to Clinics.

---

Friday, August 20th, 1920.

The meeting resumed at 3 p.m., the President in the chair.

The President—Our first business this afternoon is the report of the Executive Committee, which will be presented by Dr. Grant.

#### REPORT OF EXECUTIVE COMMITTEE.

“Moved by Dr. Webster, seconded by Dr. Fleming, that Toronto be the next place of meeting for the Canadian Dental Association.

“The following nominations and appointments were made for the different officers and committees:

President—Dr. Woodbury, Dr. H. F. Whittaker.

1st Vice-President—Dr. Sydney W. Bradley, Dr. Harry Abbott.

2nd Vice-President—Dr. Emery C. Jones, Dr. G. K. Thompson.

Chairman of Executive Committee—Dr. F. J. Conboy.

Secretary-Treasurer—Dr. E. A. Grant.

Finance Committee—Dr. J. Bothwell, Dr. A. E. Webster, Dr. Fleming, Dr. R. G. McLean, Dr. Wallace Seccombe.

Committee on Arrangements—Dr. W. A. Black, Lt.-Col. W. G. Thompson, with power to add.

Committee on Legislation—Dr. W. D. Cowan, Dr. Bush, Dr. Clay, and the Professor of Jurisprudence of each Dental College in Canada.

Oral Hygiene Committee—Dr. F. J. Conboy, Dr. Wallace Seccombe, Dr. Harry Thompson, Dr. J. A. Bothwell, Dr. George W. Grieve.

The above Committee is recommended to add the Secretary of each Provincial Hygiene Committee where such exists. In provinces which have no Hygiene Committee the Dental Board of the province should be asked to appoint a representative.

Committee on Dental Research—Dr. Wallace Seccombe, Dr. R. Gordon McLean, Dr. Emery C. Jones, Dr. Bush, Dr. Bagnall, with power to add.

Committee on Foreign Relations—Dr. A. E. Webster, Dr. Woodbury, Dr. Eudore Dubeau, Dr. H. F. Whittaker, Dr. Wallace Seccombe.

Programme Committee—Dr. R. Gordon McLean, Dr. Percy Moore, Dr. J. A. Bothwell, Dr. Gausby, Dr. W. B. Amy.



Committee on Dental Education—Dr. Woodbury, Dr. Dubeau, Dr. Secombe, with power to add.

The Executive Committee would like this Association to pass a resolution requesting the Committee on Legislation to support to its utmost capacity any effort which any provincial Committee may make to improve the legislation of that province regarding dental matters, and to bring in a report at our next meeting setting forth a plan whereby the different Provincial Dental Acts may be made more uniform.

The Report was considered and adopted clause by clause.

#### ELECTION OF OFFICERS.

In the report of the Executive Committee, Dr. Woodbury and Dr. H. F. Whittaker were nominated for President. Dr. Woodbury retired in favor of Dr. Whittaker, and Dr. Whittaker was duly declared elected as President of the Association for the ensuing term.

Dr. Sydney W. Bradley and Dr. Harry Abbott were nominated for 1st Vice-President. Dr. Abbott retired in favor of Dr. Bradley, and Dr. Bradley was duly declared elected.

Dr. E. C. Jones and Dr. G. K. Thompson having been nominated for 2nd Vice-President, a ballot was taken.

Drs. MacSween, Hodgson and Graham were appointed as scrutineers. As a result of the ballot, Dr. Jones was declared elected, the ballot standing: Dr. Jones, 35; Dr. Thompson, 20.

The other appointments as named by the Executive Committee were duly approved.

#### REPORT OF NECROLOGY COMMITTEE.

Dr. Grant submitted the report of the Necrology Committee, as follows:

The Canadian Dental Association learn with deep regret of the death of Dr. L. D. Guise, of Montreal, and wish to express their sympathy to his family and to the faculty of the Laval Dental College, with which Dr. Guise was affiliated. The Association also recommends that the Secretary be instructed to convey through Dr. Nolin our sympathy.

We also desire to have placed on the records of the Association our sympathy for the families of the Association who lost members in the late war.

J. A. BOTHWELL,

Chairman.

The Report was adopted by the members rising in a body.

Report of Dominion Dental Council was presented by Dr. Bush. This is now in force all over Canada except Quebec Over 500

certificates have been issued. He briefly outlined the latest regulations and requirements and stated that the Council now had a surplus of \$17,000 to its credit.

The Report was received.

#### REPORT OF COMMITTEE ON REPORTS.

Dr. Magee presented the report of the Committee on Reports, as follows:

The Committee on Reports beg leave to report as follows:

#### PRESIDENT'S ADDRESS.

1. That the work now being done by Canadian Oral Prophylactic Association and the Research Foundation, inasmuch as the nature of this work is so similar, be co-ordinated and these activities conducted by both bodies in such manner as may be decided upon by those qualified to deal with these matters.

2. That the question of dental education be referred to the Committee of the body appointed to deal with such matters.

3. That the question of dental legislation be referred to the Committee on Dental Legislation with a view to bringing about a unification of the laws of the various Provinces, thus promoting harmony and closer working relationships among the several Provinces of the Dominion.

4. Touching the question of public health, we would suggest that the Committee on Oral Hygiene be asked to make as effective as possible the work entrusted to them, so as to bring as quickly as possible to the public generally the estimable value of the health of the mouth and the terribly evil consequences following a neglect of this matter.

5. We would recommend that the Committee on Arrangements be asked: (a). To exercise great care in the selection of clinicians and to see that such clinicians as well as all advertisements or advertising matter distributed by exhibitors conform to an ethical standard in keeping with the teaching and practices of the Canadian Dental Association. (b). To invite from as many as possible of the members of the Association for the programme of the next meeting touching upon the questions which in the opinion of those members would be of greatest interest to the general body of the Profession.

After discussion by Dr. McDonagh, the report was adopted.

The business of the Convention having been concluded, the meeting adjourned.

CANADIAN DENTAL ASSOCIATION FINANCIAL STATEMENT.

RECEIPTS 1920, C. D. A.

Jan. 1st—Cash on hand .....	\$ 540.00
June 30th—Bank interest to date .....	7.35
Aug. 24th—Registration 208 members at \$5.00 .....	1,040.00
Dec. 22nd—Dr. Oliver Receipts from Exhibitors.....	1,082.85
Dec. 31st—Interest to date .....	6.79
	<hr/>
	\$2,676.99

EXPENDITURES C. D. A.

Mar. 25th—Local Executive cheque .....	\$ 100.00
June 24th—Local Executive cheque .....	100.00
July 19th—Ambrose Kent and Co., badges .....	48.96
Aug. 18th—Dr. Clarence Grieves .....	150.00
Aug. 19th—Dr. T. Sydney Smith .....	100.00
Aug. 20th—Dr. Clyde Davis .....	150.00
Aug. 20th—Mr. Boyd, running lantern .....	12.40
Sept. 3rd—Coniffe & Co., signs for Convention .....	6.50
Oct. 20th—Mr. Young, reporting Convention .....	165.90
Oct. 20th—Miss Faith, Assisting Secretary .....	25.00
Oct. 22nd—Dadson Merrill Co., Printing .....	412.76
Dec. 2nd—Dr. McCaughey, Stamps, etc. ....	3.70
Dec. 22nd—Secretary, small accounts paid from personal cash and expenses to Executive meeting in Toronto .....	39.68
Dec. 31st—Cheque to Dr. Grant .....	1,362.09
	<hr/>
	\$2,676.99

This account has been audited and found correct.

(Signed) C. H. JUVET, D. D. S.

S. G. McCAUGHEY, D. D. S.

Dr. T. Sydney Smith would only accept \$35.00 of the honorarium given to him, and donated the balance, \$65.00, to the Canadian Dental Research Foundation.

RETAINING COTTON ROLLS.—The problem is to keep the rolls in place, particularly in the lower jaw, where the tongue always has a tendency to toss the rolls out of position. This may be obviated by slipping an ordinary rubber dam clamp over the tooth after the rolls are in place, allowing the beaks of the clamp to grasp a small portion of the roll between the clamp and the tooth. This will hold the roll securely and will also prevent the clamp from hurting.—*Ed., Dental Facts.*



## Chicago to California and Return

(CONTINUED FROM THE MARCH ISSUE.)

ABOUT half-way between Los Angeles and San Diego is the old Mission of San Juan Capistrano, founded by the Spanish monks in 1776. We had luncheon at a restaurant across the street from the Mission, and then, escorted by one of the holy Fathers, we went through what remains of this famous old building. The romance which attaches itself to the early history of these Spanish Missions in California impresses me more and more as I study them. They were established under difficulties unheard of in these later days of our civilization, and they represent a zeal and enthusiasm which I do not believe could be easily duplicated to-day. When one recalls the conditions under which they were founded, one is struck with the enormity of the task. There were no railroads or steamships, no Panama Canal, no routes across the North American Continent. The only way the Fathers could reach California from Spain was to sail laboriously around the southern end of South America and up to the West Coast. This was not only an uncomfortable trip, but it was a dangerous one. When they arrived there was no one to meet them but the Indians, and in this unpromising field they began their work. What they accomplished all up the coast of California in erecting buildings and establishing missions is marvellous. Whatever may be our religious belief or unbelief, we can have nothing but admiration for the energy and self-sacrifice represented by this movement. The old buildings are, of course, to-day much fallen in decay, and yet they are being preserved as best they may by the devotion and zeal of those who have them in charge.

A striking example of the primitiveness of everything in those early days was represented by two of the old stone mortars in which the Indians were accustomed to grind their food. These were hollowed cut in the shape of a bowl, and each had a well-formed stone pestle. I was impressed with one thing as I looked over this Mission and its accessories—the difference in the relative value of time in those days



and now. They would work laboriously and patiently on a given article for weeks and months, while with us, if the same article could not be turned out every five minutes, we would have a fit and exclaim to high heaven that we were being robbed of our time. Ah, me, I sometimes wonder what this good old world of ours will be like in another hundred years if we keep up the same pace we are travelling to-day. (Between you and me, I would like to come back and see it.) Volumes might be written about what one finds around these old missions, but I must hurry on.

In Los Angeles I found the profession alive and alert in everything dental. They have a good school there—the Dental Department of the University of Southern California—of which, as I have already said, the Dean is my good friend, my dear friend, Dr. L. E. Ford. Through his kindness I was privileged to appear before the different classes, and the inspiration I received from looking into the faces of those splendid students still remains with me. There is an atmosphere, a depth of feeling, an earnestness attached to a body of dental students that is most inspiring. It brings out the best there is in a man, and I have often thought that if it could be the privilege of every dentist to be a teacher in a dental school, the personnel of the entire profession would thereby be vastly improved. There is an urge, an obligation, a spiritualizing influence, if you will, involved in the relationship of teacher and student which makes of the former a better man. It is inconceivable to me that a professor in college could ever be renegade to the highest ideals of professional life, and I have always felt that if a man did not have within his very soul the deepest convictions regarding professional probity and honor, he would much better keep out of college teaching entirely.

The last night I was in Los Angeles I had the honor of reading a paper before the Los Angeles County Dental Society—a paper which I had written on the train between Chicago and California. I sometimes wonder if I shall ever have the brains to so regulate my affairs that I may have sufficient time in which to do the things I want to do, and not be obliged to hurry everything so that it is indifferently done.

The Los Angeles men were infinitely kind and generous in their reception of the paper, and in their treatment during my entire stay. I left there with sentiments of the greatest affection for the splendid men of Southern California. They are open-hearted, spontaneous, loyal, and altogether lovable. I was frank enough to tell them that I had one real grievance against California—it has taken some of my best friends, and it has kept them. I do not like to lose my friends, but if they must go any place, I do not blame them for going to California. There is something alluring about the life out there. There is not the tension we see in the Middle West; there is less of the stress and strain of life. Then there is the sunshine—a real asset, of which the most is made. I could write much of the virtues of

Southern California, but after thinking it over, I do not feel that it is necessary. This pleasant function may safely be delegated to the people who are living there. I have never found one who was remiss in his duty in this regard—bless their hearts. I was afraid to remain there too long lest I should catch the fever myself.

One great drawback I found to California—it is too far away from Chicago and from Toronto. Everyone knows what I think of these two places. When airplanes are perfected so they can land more softly, I shall go to California oftener.

*C. H. Johnson*

---

### Announcement

---

WITH a desire to be of the greatest possible service to the people of Ontario, the Royal College of Dental Surgeons announces a scheme by which lectures, clinics and demonstrations related to Dentistry and Public Health may be given to any society or group of persons who may desire such service. The College desires to extend its teachings beyond the class room to every part of the Province.

#### ARRANGEMENT FOR THE SERVICE.

All correspondence concerning the course should be addressed to the Royal College of Dental Surgeons, 240 College St., Toronto.

Arrangements for a lecture, clinic or demonstration must be completed at least two weeks before the date upon which it is to be given.

#### WHAT IT WILL COST.

The organization or persons who arrange for a lecture, clinic or demonstration will be expected to pay the lecturer's travelling and living expenses for the trip.

The College will pay the lecturer a fee of \$25.00 for each visit to partly re-imburse him for the time lost from his regular duties. Consideration will be given for unusual expenditure of time in long trips or extra days.

#### LIST OF SUGGESTED SUBJECTS.

A list of suggested subjects which may be of assistance in planning a course of lectures or for a single lecture, clinic or demonstration will be forwarded upon request.

#### LECTURES NOT LISTED.

Any Dental Study Club, or group of persons who wish a lecture or a course of lectures on a subject not listed should write the College, stating what is wanted, and special arrangements will be made, when possible, to meet the desires.

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, APRIL, 1921

No. 4

## EDITORIAL

### Dr. Arthur D. Black and the Index to Periodical Dental Literature

THE first volume of the Index, covering Dental Literature from 1911 to 1915, inclusive, is now available through the Secretary-Treasurer, Dr. Abram Hoffman, 381 Linwood Ave., Buffalo. The book is a very creditable volume of over 500 pages, in two parts. The first part is a classified subject index of papers, discussions and clinics as published in Dental journals in the United States, England, Canada, Australia and New Zealand. There are 40,000 articles classified under about two hundred headings, so that one may easily find all the articles on any desired subject. For each article is given the number of pages devoted to discussion, etc. The difficulty of locating in the literature what has been written on any subject has been obviated once and for all.

Part Two is an alphabetically arranged author index, giving a list of books, papers, discussions and clinics,—a complete record of the contributions of each man towards the progress of the Profession, as recorded in our journals.

This stupendous work has been done under the direction of Dr. Arthur D. Black, without remuneration, and is published by The American Institute of Dental Teachers. Dr. Black has sacri-

ficed many, many hours of time in the accomplishment of this task, and has earned the thanks and sincere regard of every member of the Profession for the courage, determination and efficiency with which he has carried this work to successful conclusion. It is expected that the next volume, covering the period from 1916 to 1920, will be ready in about a year's time.

The most practical way to show appreciation of Dr. Black's work is to subscribe to the Index. Dr. Hoffman will be glad to send particulars to any man who is interested.

## Ontario Dental Society

54th Annual Convention

May 2-3-4-5, 1921

Toronto, April 1921.

Dear Doctor,—

The best program ever put across by any dental committee in charge of an Annual Convention, is yours for the first week in May. Here are its chief features:

First of all, the real dope on the X-Ray in Dentistry by men who are using it every day. This will include a detailed anatomy of parts, the expert handling of the machine, developing films, etc. And, probably the most important part, INTERPRETATION and MISINTERPRETATION of the radiographs. Four trained experts will instruct on the reading of radiographs, two each on interpretation and misinterpretation, showing anatomical conditions as well as pathological and their easy confusion in radiographs.

Dr. Seccombe's unique lantern lecture on Diet will be just as popular here as it is in the many big cities across the border where it has been so enthusiastically received. In conjunction with this there will be a Progressive Clinic in Preventive Dentistry that will open your eyes—everything from dental anatomy to a table spread with a "balanced diet."

No feature has earned greater popularity than the Hamilton Clinic Club. This year they will have something on Dr. Roach's Inlay and Cast Clasp technique which will be just like their own organization,—right up to the minute.

The Anaesthesia Clinic will include General Anaesthesia as well as Conduction and will be absolutely the best ever put over. Dr. Cotton, who has done so much with his new ether anaesthesia, will tell us all about it. Two experts will deal with nitrous oxide; and Conductive Anaesthesia will be taken by several men thoroughly conversant with its use.

Don't forget, we'll have Dr. Clapp.

And there will be class reunions and a Fraternity dinner on Wednesday evening. You will get the details from your class executive.

Yours for a "bang-up" Convention,

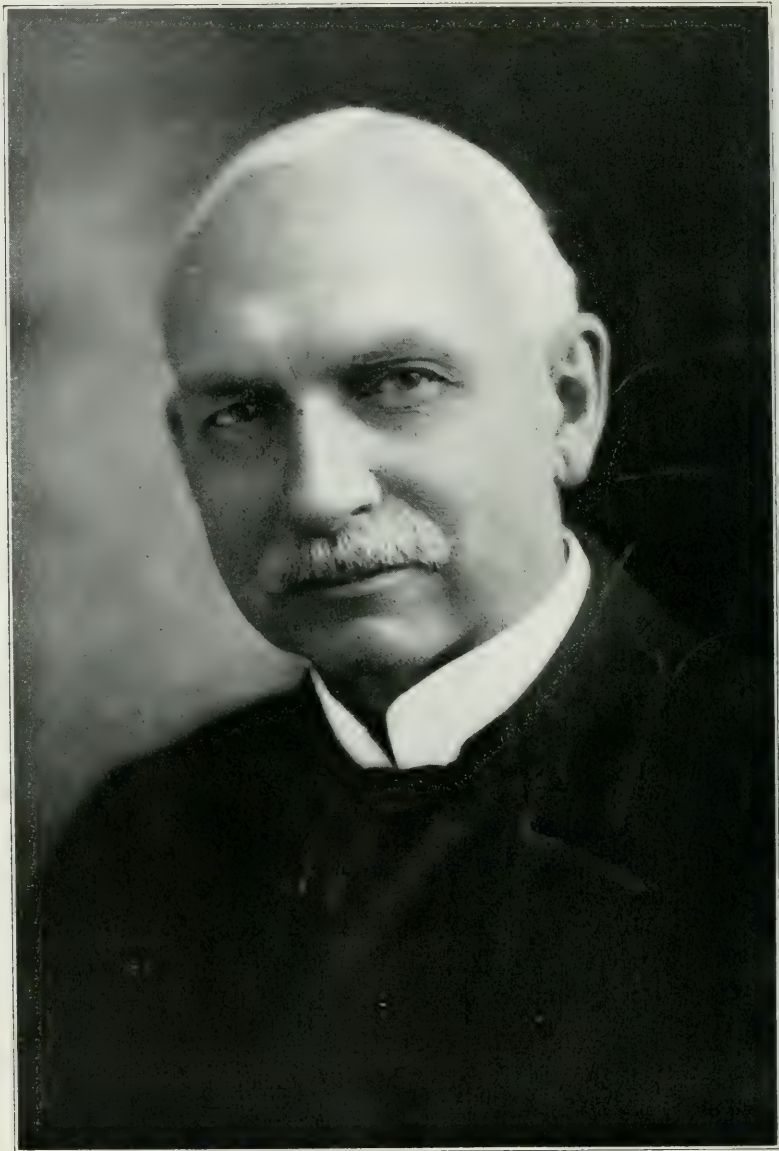
C. E. BROOKS,

W. L. CHALMERS,

Publicity Committee.



“ Not in the clamour of the crowded street,  
Not in the shouts and plaudits of the throng,  
But in ourselves, are triumph and defeat.”  
—Longfellow



C. N. JOHNSON, M.A., L.D.S., D.D.S.<sup>1</sup>

*Chicago, Ill.*

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, MAY, 1921

No. 5

## Some of the Present Influences in Dentistry

BY C. N. JOHNSON, M.A., L.D.S., D.D.S., CHICAGO, ILL.

SOME of the tendencies in operation today are of a very healthy nature. It is a wonderful age in which we live—professionally, industrially, and sociologically. The disjointed condition of affairs in many of our activities incident to reconstruction, following the most colossal crime of all history, are already in process of adjustment; and we may look with the utmost confidence toward the future.

In common with all the varied interests of life our profession has not escaped the inevitable necessity of a certain amount of readjustment. This readjustment may easily be made to result in great benefit to the profession and to the people; or it may be made to work irreparable injury to both.

One of the healthy signs of the times in dentistry is the active interest being taken in dental society work. Never in the history of the profession was the attendance at dental meetings so large, nor the interest so keen. Never was there more energy being expended by teachers in our dental colleges than there is today. Never was the demand greater for graduate courses in the various so-called practical branches of our profession, to say nothing of the aggregate of scientific study. All of these tendencies are most encouraging, and they augur well for the future advancement of dentistry.

But there is another phase of the picture—a slight shadow here and there which must needs be somewhat vigorously retouched if we are to come into the full fruition of our aims and ambitions.

In common with the general disorganization of human affairs

\*Read before the Los Angeles County Dental Society, February 15, 1921, and published in Oral Health by courtesy of Dr. Jules Endleman, Los Angeles, California.

the world over, there has crept into dentistry certain tendencies which must be met with a bold front and grappled with a strong hand, if we are to prevent a widespread distrust and a grave reflection upon the reputation of our beloved calling. There are not wanting today ample indications that the intelligent public are beginning to raise the question-mark upon some of the prevalent practices of the hour.

One of the tendencies alluded to, while not in itself actively pernicious, is capable of doing great injury unless it is curbed. This relates to the inclination—altogether too widespread—to run to extremes in methods of practice. The profession has suffered more or less from extremists since the earliest days of its history, and why it has not learned a useful lesson from this is one of those inscrutable things incident to human nature. Space does not permit of a detailed consideration of all the various extremes to which the profession has run in the recent past, but a brief mention may be made of one as illustrative of what is happening in several lines of practice.

The great demand for the replacement of partial sets of teeth where a few of the natural organs have been lost, leaving spaces in the arch to be filled by artificial substitutes, has awakened the ingenuity of men to a very wonderful degree. It has resulted in many methods or systems of replacement each of which has its virtues and its indications in practice. Each commands our respect for its ingenuousness and its applicability to certain cases. The men who have worked out these various systems are entitled to our consideration and commendation—up to a certain point. That point is reached when they become narrow enough to claim universal applicability for their own method to the exclusion of all other methods. The moment a man, however brilliant he may be, sees only one thing in practice, or only one method, that moment he becomes dangerous. And the moment he systematically begins to discredit or tear down other methods to advance the claims of his own that moment he becomes despicable. When will humanity learn that no man ever succeeded in elevating himself by the process of undermining others?

A case in point is worth mentioning. Some of the advocates of the more recent systems of replacement have gone out of their way to attack most strenuously the merits of fixed bridgework. Unquestionably much fixed bridgework in the past has been ill-advised and contraindicated. It has been abused as has been every other method of practice. But to make the sweeping statement or assertion that fixed bridgework is wholly wrong in principle and is always contraindicated, is to go counter to the experience of observant men from the day it was first employed till now. It has been so acceptable to the people, and under its proper indications so serviceable, that to discountenance it entirely in furtherance of the claims of other methods which, no matter what their virtues, have not had anything like the



extended trial that has fixed bridgework, is to exhibit a mental bias which cannot be said to be wholly without prejudice. It is safe to assert that had fixed bridgework never been devised there are countless numbers of people who for years have enjoyed the blessings of adequate mastication, but who would otherwise have been seriously handicapped in the performance of this important function. When one considers the lack of judgment in its use the marvel is that it has made as good a record as it has. The real test of any method is its actual service in the mouth over a period of years, and judged by this standard, fixed bridgework has produced ample evidence of its value, and fully justified its existence. One case in point, among many others which might be cited: There died in Chicago, a few weeks ago, a woman who carried to her grave a fixed bridge on her upper teeth which extended from the molar on the one side around the arch to the second bicuspid on the other, with at most five abutments. She had worn this bridge with great comfort for more than a quarter of a century. She was a frail woman when the bridge was made, and her physician had urged that she be provided with some means of adequate mastication. One case does not prove everything, but it is at least safe to assume that if the entire principle of fixed bridgework were wrong this bridge would not have had the record it did. Personally I am convinced that it prolonged the patient's life.

Why it is that men cannot be broadminded? Why do they summarily discard the old and tried, the moment something new and untried has been introduced? We welcome new inventions—we have need of them. But in welcoming the new it is not seemly nor sensible that we aim to sweep away with a wave of the hand all the methods that have gone before. There are indications for the employment of every known method which has in any way proved its merits in practice, and the best interests of dentistry will not be served by a narrow prejudice which sees only one method or one system.

Another tendency of the present I view with even graver apprehension than the one just alluded to. It is an evil which in certain localities has assumed proportions which threaten to react on the profession in a very unfortunate way. I refer to the practice which some men are pursuing, under the guise of modern methods, of exploiting the people and playing on their fears in an altogether unwarranted manner. To explain just what I mean it will be necessary for me to recite some specific cases in practice. These cases are authentic and I would hesitate to refer to them were it not for the purpose of pointing a moral, and entering a protest. Manifestly there must be a motive behind every professional procedure, and in some of these cases I am not questioning the motive. In others I decidedly am. Since the subject of focal infection has been so much to the fore both in medicine and dentistry, some very unique theories

have been propounded and some rather rare methods of practice have been introduced. Many men are perfectly conscientious in the attitude they are assuming and really believe they have just cause for their procedures. They are convinced beyond peradventure that focal infection is at the root of most of the evils connected with human ailments, and they are equally positive that the teeth are the chief culprits in introducing infection into the system. To say to them that the real significance of focal infection in the incidence of disease is not yet definitely settled, or to intimate that undue emphasis has been placed upon the teeth as causative factors in infection is to elicit from them a cry of holy horror, and the charge that the wheels of progress are being blocked. They are convinced in their own minds that they are right, and it is not my purpose to enter into a debate on this very debatable subject. I will merely say parenthetically that it is my firm conviction that while focal infection is a very real and very important factor which cannot be ignored in the treatment of disease, and that while the teeth under certain conditions are perfectly capable of spreading infection, yet the role played by infection in causing many of the diseases which are today being attributed to it, and by the teeth as the chief means of bringing about this infection, has been exaggerated out of all proportion to the actual facts in the case. This is something which must be settled in the future on the basis of a longer clinical experience, and a more unbiased observation, and I freely pledge myself that if in the ultimate my position is proved untenable, I will as frankly admit it as I am today questioning some of the prevalent ideals of the hour.

But my chief basis of contention at this time is with the man who, irrespective of his convictions in the matter, is seizing upon the present agitation of this subject to induce people to submit to certain kinds of service which in their saner moods they would never think of having performed. To unduly frighten people about disease of any kind is a grievous wrong, and when people who are in good health are induced to have serviceable teeth extracted on the theory that they may some day cause trouble, it is carrying so-called precaution to the point of folly. I have known people to be so frightened at the prospect held up to them by dentists that they have had this very thing done, only to regret it later.

The discussion of this question of focal infection and the extraction of teeth cannot well be approached without a consideration of the X-ray. So much has already been said upon it that it would seem superfluous to refer to it at this time. And yet the last word has not been said about the X-ray, and its relation to the subject under discussion. The X-ray came to us in a dual capacity. It was at the same time the greatest benefactor and the biggest curse that has ever entered the dental profession. What would we do today

without this splendid accessory to our work? We would be really lost without it; and yet it is safe to assert that many of our patients would be infinitely better off today if it had never been invented. Why this apparent discrepancy? It is all due to our faulty interpretation of the X-ray, and to our assumption that it will do more than it actually does. This subject is worthy of more elaboration than can be attempted at this time, but reference must be made to a few pertinent facts which have a decided bearing on the question under consideration. In the first place, the X-ray will not show pus formation, it will not demonstrate alveolar abscess, and it will not prove that infection is present. The only thing the X-ray will do with pulpless teeth is to show varying degrees of density in the bone surrounding them. And yet radiographers everywhere are writing with the most utter abandon such terms upon their X-ray films as "pus pocket," "abscess," "infection," etc., etc. And they are thereby frightening people in a wholly reprehensible manner. The mental strabismus that the introduction of the X-ray has caused to many practitioners constitutes itself one of the great evils of the day, and until men can find their balance and gain a proper perspective in their interpretation of the X-ray it will continue to do untold harm.

But worse than all this is the manifest tendency among certain members of our profession to exploit the people through the medium of the X-ray. They take advantage of the ignorance of the public on this subject, and make diagnoses which they know in their hearts are not correct. They write "abscess" at the roots of teeth with living pulps; and they write "pyorrhea" or "alveolar absorption" when they cannot write anything else. All of this is not due to misconception on their part—some of it is due to chicanery. As one eminent radiographer has remarked: "It is a very brave X-ray man who will write on a picture 'I find nothing pathological.'"

To place such formidable terms as "abscess," "infection," etc., on a radiograph and hand it to a patient is little short of criminal unless there is a moral certainty that they are correct, but this is being done daily in the most off-hand and routine manner. When will members of the profession awaken to their grave responsibility in this important matter and be more conservative in their treatment of their patients?

I promised to recite a few cases in practice to illustrate an unfortunate tendency toward playing upon the credulity of the public. They are selected at random from among very many which might be cited. A lady patient who was not feeling well was referred by her physician to a man who was making a specialty of radiography and oral surgery. His diagnosis was that an upper first permanent molar should be extracted because it was abscessed, and that an upper third molar should be removed because it had three



cavities and was not worth filling, and that there was a serious alveolar absorption between several of the other teeth. The facts were these: The first permanent molar had a living pulp, the third molar had not a cavity at all, but carried a large filling which was in good condition, and the alveolar absorption was not in the slightest degree more pronounced than one would ordinarily find in a woman of her age. In fact the mouth was an unusually healthy one and showed not the slightest trace of pathology. And yet that man had given this diagnosis to a woman who was so susceptible to impressions that to look her in the face and tell her that she appeared very ill would be to result in her illness in a few minutes. Is that right? Is it professional?

Another was a case of a gentleman who was fortunately not impressionable. He had been ill, and was sent to an X-ray man for radiographs of his teeth. These were submitted to a practitioner, who condemned the teeth—conscientiously condemned them. The patient was finally sent to me and I did not agree with the findings of the other practitioner. In this conflict of opinion the patient naturally sought the advice of various men. One day he wrote me: "They are making a bacteriological examination of the contents of my mouth to see if they find the streptococcus. If they find it I will let you know." I wrote back: "My dear sir: I predict that they will find the streptococcus for the simple reason that it may be found at times in every mouth, healthy or otherwise."

The point I make is this—that the man who knew enough to make a bacteriological examination at all, knew very well that he would find the streptococcus. From the bottom of my heart I hate this kind of posing on the part of professional men, and I propose to fight it as long as I am able to fight anything. Incidentally the man recovered from his illness, and equally incidentally he has all of his condemned teeth.

Speaking of posing reminds me of one case which, were it not for the danger it involves of reflecting on the profession, is sufficiently farcical to elicit nothing but a laugh. A lady developed a toothache, and in the absence of her regular dentist she applied to another for relief. The dentist so consulted was very impressive in his demeanor, and told her that before making an application for the relief of pain in her tooth it would be necessary to make a careful examination of her heart. The lady has been trained to accept implicitly the judgment of her professional adviser, and submitted to the examination, after which the application was made to the tooth. Contrary to all the accepted laws of scientific treatment the tooth still continued to ache, and the patient was obliged to apply to the dentist the following day for relief. Again she was informed that the heart examination would be necessary, and again this important function



was performed. When the tooth still persisted in paining after all this marvelous display of professional skill, the patient concluded that it was beyond the reach of human agency and refrained from further consultation. Comment on this case is unnecessary, except to suggest that occurrences such as this cannot be considered conducive to respect for the profession on the part of the public.

One other tendency in the profession for which we may exhibit greater charity is the one already alluded to wherein conscientious men are going to extremes which cannot be considered safe and sane. The agitation about pulpless teeth and focal infection has thrown many worthy men off their balance and driven them to conclusions which are unfortunate. As has already been intimated, this question has not yet been definitely settled, and all right thinking men should remain open to conviction, but in the light of our clinical experience from the time pulpless teeth began to be filled till now, and with the record that myriads of these teeth have made for efficient and satisfactory service, to contend, as is sagely being done in certain quarters to-day, that all pulpless teeth should be extracted is to carry radicalism beyond the bounds of reason.

Likewise to advocate the curettage of all sockets from which pulpless teeth have been removed, the general practice of taking stitches in the gum where teeth have been extracted without serious laceration—in other words, the so-called “surgical removal of teeth,” must have a better basis of argument than that being put forth by its advocates to-day.

The prevalent procedure of opening into the gum and bony tissues where the teeth have been out for years in the search for infective areas which are supposed to cause rheumatism must be classed under the same category of extravagant practice. While we may respect the personality of the men who do these things, we cannot have the highest regard for their judgment.

To prove that I am drawing no fanciful picture of what is actually being done, permit me to refer to two incidents which have recently come under my notice. Both came from conscientious men, men who are entitled to the respect of their fellow-man so far as their intentions are concerned. One claimed in public that he had opened into the bony tissues of an edentulous mouth for the relief of rheumatism in a case where the teeth had been extracted fifteen years previously. The other remarked that he intended to extract a tooth from the mouth of a member of his own family in which he had some time ago placed an inlay. He recalled that the cavity was large and came near the pulp, and on the possibility that this pulp might some day die and the tooth thus become pulpless he proposed to eliminate it from the mouth.

Gentlemen, I have the prediction to make that our present age will some day be referred to as one of the greatest idiocy in the history

of the profession; and yet in the same sentence I would like to revert to an intimation made in the early part of the paper, wherein the inference was suggested that some of our present day tendencies were encouraging in the extreme, and that the prospect for the future was one to which we might look with the utmost confidence. I have the conviction that the ultimate good sense of my profession will carry it safely over the few aberrations which to-day tend to obscure its horizon, and that we will go safely and surely on to even greater attainments than we have ever achieved in the past.

The present era marks the dawning of a better day in dentistry, when the members of the profession will acquire a broader vision, and achieve a higher concept of their obligations as professional men in their relationship to society at large; when our efforts will be directed more and more toward checking disease at its source; when prevention shall be the watchword of the hour and the terrible conflagration of decay and disease shall be wiped from the mouths of the people. Till this day comes let us resolutely put our shoulders to the wheel, determined to do the utmost in our power to utilize the knowledge and the means at our present command, in a loyal, unselfish service to the people who are committed to our care. If we do this, even though we may make mistakes, we will at least absolve ourselves from the charge that we have been remiss in our professional obligations.

---

### In Honor of Charles Nelson Johnson, M.A., L.D.S., D.D.S.

---

ON Monday evening, April 11th, 1921, there assembled at Hotel La Salle, in the City of Chicago, Dentists and prominent citizens from every point of the compass, to attend a Testimonial Banquet tendered to Dr. C. N. Johnson by the Dental Profession of Chicago and his former students, in celebration of his completion of forty years of professional service.

The Banquet was the largest of its kind ever held in the City of Chicago, and was attended by well on to a thousand people who delighted to honor the guest of the evening.

An interesting feature of the programme was the unveiling of a bronze bust of Dr. Johnson, and the presentation of a beautiful oil painting and other personal gifts from Dr. Johnson's students and friends.

In the absence of Dr. Don Gallie, the duties of Toastmaster were ably performed by Dr. Logan.

The speakers were: Dr. Henry E. Friesell, Pittsburgh, Pa., upon the subject of "Dental Education and the Need of Trained Dental Teachers"; Dr. Wm. A. Evans, Chicago, "Johnson the Citizen"; Dr. John V. Konzett, Dubuque, Iowa, "Johnson the Practitioner";

Dr. Wallace Seccombe, Toronto, "Johnson and His Native Land";  
 Dr. Otto U. King, Chicago, "Johnson the Author and Editor," and  
 Dr. John P. Buckley, Los Angeles, California, "Johnson the  
 Teacher."

When Dr. Johnson rose to respond, he was greeted with a most  
 enthusiastic demonstration. The guests rose to their feet, and for  
 some minutes continued to show their respect and admiration for Dr.  
 Johnson.

There are few men in the Profession of Dentistry who have ren-  
 dered such excellent service as Dr. Johnson. Dr. William Bebb has  
 compiled the following list of interesting facts, which indicate the  
 long and varied activities of Dr. Johnson on behalf of his Country and  
 his Profession:

Born, Brock, Ontario, March 16, 1860.  
 Graduated Port Perry High School, 1876.  
 Graduated Royal College of Dental Surgeons, Ontario, 1881.  
 Practised two years in Collingwood, Ontario.  
 Graduated Chicago College of Dental Surgery, 1883.  
 Practised dentistry in Chicago, 1885 to date.  
 M. A. Degree Lake Forest University, 1897.  
 Demonstrator of Anatomy, Chicago College of Dental Surgery, 1886.  
 Adjunct Professor of Operative Dentistry, Chicago College of Dental  
 Surgery, 1889.  
 Professor of Operative Dentistry, Chicago College of Dental Surgery, 1890  
 to date.  
 Associate Dean, Chicago College of Dental Surgery, 1906.  
 Dean of Students, Chicago College of Dental Surgery, 1907 to date.  
 Editor, The Bur, 1896 to 1902.  
 Associate Editor Dental Review, 1893.  
 Editor Dental Review, 1894, 1902 to 1918.  
 Contributing Editor Oral Health, 1919 to date.  
 Editor Desmos, 1920 to date.  
 President of the Illinois State Dental Society.  
 President Odontographic Society.  
 President of the Chicago Dental Society.  
 President of the Odontological Society.  
 Supreme Worthy Master of the Delta Sigma Delta Fraternity.  
 Supreme Grand Master of the Delta Sigma Delta Fraternity.  
 Member Chicago Dental Society.  
 Member Illinois State Dental Society.  
 Member National Dental Association.  
 Member Odontological Society.  
 Honorary Member Nebraska State Dental Society.  
 Honorary Member Iowa State Dental Society.  
 Honorary Member Kansas State Dental Society.  
 Honorary Member Southern Minnesota Dental Society.  
 Honorary Member Ontario Dental Society.  
 Honorary Member Isaac Knapp Dental Coterie, Fort Wayne.  
 Honorary Member Detroit Dental Society.  
 Honorary Member St. Louis Society of Dental Science.  
 Honorary Member Odontological Society of Victoria, Australia.  
 Honorary Member Dental Graduates Society of Victoria, Australia.  
 Honorary Member Odontological Society of New South Wales, Australia.  
 Honorary Member and Fellow of the New York State Dental Society.  
 Associate Member of the First District Dental Society of the State of New  
 York.  
 Associate Member Saskatchewan Dental Association.

## DR JOHNSON'S ORIGINAL ARTICLES AND EDITORIALS

Year	Original	Articles	Editorials
1888	2		
1889	1		
1890	3		
1891	7		
1892	1		
1893	2		9
1894	4		30
1895	2		
1896	6		7
1897	3		7
1898	3		4
1899	3		3
1900	6		8
1901	3		7
1902	6		2
1903	6		20
1904	4		31
1905	7		23
1906	6		28
1907	4		26
1908	6		29
1909	7		32
1910	7		25
1911	6		26
1912	11		25
1913	4		29
1914	9		26
1915	6		24
1916	3		23
1917	4		27
1918	1		25
1919	2		11
1920	2		20

## DR. JOHNSON'S BOOKS

"*Principles and Practice of Filling Teeth*"—1900.

"*Text Book of Operative Dentistry*"—1909.

"*Success in Dental Practice*"—1903.

"*The Adventures of Hal Byrne*"—Serial.

"*The Little Canuck*"—Serial.

"*The Hermit of the Nonquon*"—1893.

Numerous short stories in magazines.

"*Poems of the Farm*"—1901.

"*The Hand Clasp*"—1919.

Gold Medal—*Theory and Practice*—R.C.D.S.—1881.

Fellowship medal of the Dental Society of the State of New York, 1915.

The following poem, composed by Dr. Johnson, appeared upon the printed Programme, and was a most fitting contribution and greatly appreciated by those present:

## MY HOUR.

There's an hour not recorded by the clocks of standard time,  
Not remembrancer of summer nor a hint of winter's rime,  
It's an hour quite creative—by a myriad fancies fed,  
When the embers slowly smoulder, and the folks are all in bed.

Then I'm king in my dominion, with a little desk my throne,  
Swarmed about by countless subjects, though I seem to sit alone;  
And I hold such sweet communion with the play-folk of my head,  
When the night winds softly murmur and the real folk are in bed.



Nothing but a pen and paper, yet a world lies at my feet,  
 Waiting only touch of magic to portray the scene complete;  
 Visions weird and visions wondrous, like a message from the dead,  
 Stealing softly through and through me, while the dear ones are in bed.  
 Harmless ghosts and little goblins—children of another clime,  
 Some sedate and others sportive—others lowly, some sublime;  
 All are weaving with a fabric fine as any silken thread,  
 Tales and legends of the elf-land while the folks are all in bed.  
 Time is nothing but a shadow, space is spanned by winged thought;  
 All the myriad things of daytime now appear as things of naught.  
 All the real and all the unreal, thus mysteriously wed  
 By this mystic ceremony, while the folks are all in bed.

Thus I sit in waking dreamland as the moments steal away,  
 Quite unconscious, while the clock is striking in another day.  
 What though half I think's unwritten, and the other half unread,  
 Priceless is this cherished hour when the folks are all in bed.

CHARLES NELSON JOHNSON.

The Committee in charge of this very unique and successful Banquet were:—P. G. Puterbaugh, Chairman; Brophy, T. W.; Luthringer, J. P. Gallie, D. M.; Black, A. D.; King, O. U.; Grisamore, T. L.; Fuqua, V. H.; West, G. N.; Gilmer, T. L.; Knapp, G. G.; Logan, Wm. H. G.; Moorehead, H. B.; Printz, M. M.; Coolidge, E. D.; Loomis, A. G.; Dittmar, G. W.

## A Message on Preventive Dentistry\*

CALVIN SNELL, D.D.S., TORONTO.

**B**ECAUSE the writer believes that he has a real message to give you, and especially to you who are dealing so largely with children, he duly appreciates the honor and the privilege of addressing you.

The problem of preventing dental ills is at once inspiring, and sufficiently difficult, to tax to the utmost the skill and resources of the profession. It is a challenge to the best that is in us. It is a subject, too, which can be dealt with from various angles. All honor must be given those who in the field of diet are seeking to eradicate, or at least lessen, the ravages of dental caries and periclasia. It would seem as if the greatest hope of the future lies in this direction. It is evident, however, that to change the food habits of a nation is a most herculean task, entrenched and strengthened as those habits are, not only by custom, but also by selfish and commercial interests. It can also be said that while much good work has been and is being done along nutritional lines, the final word has not been said, and much remains to be accomplished. It behooves us therefore to avail ourselves of every method of proven value which lies at our disposal. Because thorough prophylactic measures have undoubtedly proven to be

\*Paper read before the School Hygiene Section of the Ontario Educational Association, Toronto, March, 1921.

of inestimable value, your attention is earnestly directed to this phase of preventive dentistry.

To the old familiar question put to every dentist by almost every patient: "Doctor, I clean my teeth regularly. Why do I have trouble?" we may now answer: "Your diet is very wrong. You are not living on a well balanced ration." But may we not also say, "You have brushed your teeth only, not necessarily cleaned them." And even when the cleaning has been done by the dentist, as it is ordinarily practiced, it is very doubtful if anything more than the obvious stains and deposits are removed. The operation is esthetic rather than preventive. Failure to accomplish anything of real preventive value in the past is a sufficient exemplification of the inadequate nature of such a procedure. It is common knowledge that under ordinary care most mouths go from bad to worse. Is there a better way? The writer believes there is.

Gladstone once said that all legislation should be framed with a view to making it as difficult as possible to do wrong, and as easy as possible to do right. Let us apply this principle to dentistry. Let us begin, by all means, by prescribing a diet which we believe to be essential to establish and maintain a normal healthy condition of the dental organs. Then let us adopt such prophylactic measures as will make it as easy as possible for the patient to do the right. Let us put the teeth in such a condition that it will be as easy as possible for the patient to really clean them, and so maintain not only the teeth, but the investing tissues, in a condition of health.

The programme to be adopted then is as follows. Instead of taking a mere half hour to remove the easily seen accretions on all the teeth, select but a few teeth, the number depending on the condition of the mouth, polish every surface of these as thoroughly as possible, and take as many sittings as are necessary to go over the entire mouth in the same thorough manner. Do this by means of suitable instruments, disks, small stones and strips, and finish polishing with silk tape, and B. and S. polishers, charged with polishing powder.

You have now done your part. You have made it as easy as possible for the patient to do his part. You have taken enamel which might previously have been likened to a rough board, and given it a finish which may be compared to a polished bit of furniture, and it is correspondingly more easily cleaned. You have also done another very important thing, and this applies particularly to our younger patients. You have in all likelihood stimulated a justifiable pride in the appearance of the teeth, and kindled an earnest desire to maintain that appearance.

Your next work is that of a teacher, since your best efforts will be nullified unless you secure the intelligent co-operation of the patient in the daily care of his mouth. And just here you will likely find your most difficult task. So many seem to lack the digital dexterity to pro-

perly use the brush, and particularly do they find their fingers all thumbs when they come to use the floss. Much patience may be required. Brushes should be kept at the office and furnished the patient. If you find that they have failed to properly do their part, use the disclosing stain, and show them where they have failed. Have them use the brushes and floss in your presence. Instruct them in their proper use. Again use the stain. If an improvement has been made, as is most likely, a never to be forgotten lesson has been learned. It is often wise to give the patient a prescription for the disclosing stain. This is particularly useful for patients who have periclasia or gingivitis. Have them apply the stain once or twice a week. See your patient frequently until you are confident that satisfactory results are being accomplished. After that a prophylaxis treatment every three or four months to supplement his efforts should be sufficient. It can not be too strongly impressed on the patient's mind that, after you have done your part, the chief responsibility for the maintenance of good conditions must rest with himself. In one thing you can rest fully assured, that where both operator and patient are enthusiastic in their efforts, the very happiest results will be secured.

---

## Book Review

---

DENTAL PROSTHETICS—By George Henry Wilson, *Western Reserve University, Cleveland, Ohio.*

**D**R. Wilson's Fourth Edition on Dental Prosthetics is a treasure well worth having, reading and studying.

The author has covered the whole subject in a very concise and instructive manner, so that one can see all the details without too much manuscript. The student should find the book very valuable for its brevity and simplicity. Dr. Wilson has omitted nothing, and I was especially pleased to see his references to Orthodontists and Exodontists, in connection with artificial denture restoration.

Dr. Wilson gives the "new school" in prosthetics plenty of space to show its true worth, and credit must be given Dr. Hall for the efficient manner in which his ideas in relation to articulation and antagonizers are exemplified. The work of Dr. Gysi is so well presented that the student in prosthetics can easily grasp the scientific physics of anatomical articulation.

The author is to be congratulated on the thoroughness of the work.

The review of this book would not be complete without a word of praise for the publishers—the book is well bound,—the paper excellent, and the type and illustrations are very clear.

— J. A. Bothwell.



# The Uses of X-Rays in Dentistry

CHARLES READ, L.R.C.P. (EDIN.), L.R.C.S. (EDIN.), L.D.S.  
(GLAS.)

*Asst. Medical Electrician, X-ray Dept., Glasgow Royal Infirmary,  
Radiologist to the Glasgow Dental Hospital.*

I WISH first of all to thank our President for the kindly expressions of confidence which he has placed on my ability to present this subject before you to-night, and while I feel my limitations in this respect, I shall try to justify that confidence to the best of my ability.

When I received the notice intimating this meeting of our Society, I observed that the title of my paper had been put down as "The Uses of X-rays in Dentistry." Perhaps if I were to substitute the words "*some* uses of X-rays in dentistry," it would be more appropriate to my treatment of the subject as it comes under the scope of this paper. The variety of uses to which X-rays have been put in the practice of dentistry within the past few years has assumed such dimensions that it will only be possible for me to give a resume of the subject from its broader aspects and indicate briefly its value in certain conditions.

The value of radiography in dentistry has been expounded by all modern writers on dental science, and the increasing number of articles and references to it in our literature is an evidence of the progress which it has made. As an evidence of the academic recognition which the subject has gained within recent years, it is noteworthy that the University of Cambridge has instituted a diploma in radiography, and also it is one of the subjects of the Higher Dental Diploma of Edinburgh.

At one time a knowledge of the application of radiography to dental science was not demanded of the practitioner, but to-day the progressive members of our profession have begun to look upon it as a real necessity. To those who are familiar with its advantages the employment of this aid to diagnosis and treatment has become indispensable.

The question of the status of the dental profession in relationship to other branches of medicine is one which has given us much scope for thought and discussion. Probably one of the foremost reasons why dental science has not attained the same degree of recognition in the eyes of the public, is that the conditions which come under

\*Read before a meeting of the Glasgow Odontological Society, December, 1920, and published in Oral Health by courtesy of The Dental Record.



the scope of our specialty are not regarded by them as being dangerous to the life of the patient. The scientific investigations of William Hunter and others in establishing the relationship between oral foci of infection and certain systemic diseases has done much to stimulate interest in this important subject. While in some cases the area of infection can be made out by clinical examination, there are many cases which would undoubtedly remain obscure but for the use of X-ray diagnosis; and, since serious apical infections can exist without evidence or history of trouble, every examination of this type should include an X-ray investigation of all crowned and pulpless teeth and suspected areas of alveolus from which teeth are absent. Physicians and dentists sometimes disagree regarding the advisability of extracting teeth to overcome oral infection. In order to obtain the co-operation of the physician in establishing a diagnosis in cases of suspected oral infection, it is necessary for the dentist to avail himself of all the scientific methods at his command and so attain his rightful position as a specialist. This would put a check upon the unnecessary sacrifice of teeth which is sometimes carried out at the present time. Dr. C. Kempster in his paper entitled "The radiograph as a preventative of complete edentulation" draws attention to this fact, and illustrates cases of patients suffering from constitutional conditions who were sent to the dentist for clearance of all the teeth, and who were cured by the extraction of one or two teeth which were discovered to be at fault. He says that, "If the dentist, and also the physician and the surgeon would awaken to the serious position of the young or middle-aged edentulous adult, and accept the means readily at hand which is offered by the requisitioning of the services of the radiologist, it is certain that the number of those who are prematurely deprived of their teeth will become less, if the loss of one or perhaps two teeth be found sufficient to effect a cure, instead of the sweeping sacrifice which is general in the absence of the knowledge and direction which is afforded by the radiological evidence."

On the other hand the dentist may, by adopting a conservative line of treatment, in some cases attempt to save teeth which are endangering the health of the patient, and by so doing imagine that he has freed from infection a septic area which still remains a source of trouble, and it may be, a menace to the life of the patient. The importance of this subject is emphasized when we consider that even in the light of our present knowledge there are many cases which baffle the skill of men of great experience in diagnosis.

It should be clearly understood that X-ray diagnosis must not be used to the exclusion of other methods of investigation, but should take its place along with the clinical examination and history. It is only in this way that an intelligent conclusion can be arrived at in

any given case. We must also recognize the limitations of any one method of examination in order that due consideration may be given to all. Errors in diagnosis are often observed owing to disregard of this important point. The X-ray examination is made and reported upon in the absence of a thorough clinical examination, with the result that undue significance is put upon the radiographic findings and errors in methods of treatment are made. What is required is a proper co-ordination between the radiographic and all the other clinical methods of examination.

In order that errors may be avoided every case which is presented for X-ray investigation should undergo a thorough clinical examination and a tentative diagnosis made, based upon this information. The radiographic findings will then serve the purpose of substantiating or disproving the diagnosis and so enable us to carry out our treatment on a scientific basis.

X-rays are produced by passing a high tension current, which is generated by a high tension inductor unit, through a glass tube exhausted to a vacuum of about a millionth of an atmosphere and enclosing terminals known as cathode and anti-cathode. By this means cathode rays are produced in the tube which strike the hard metallic surface of the anti-cathode or target, and spread from the points of impact all round in straight lines. These radiations have the property of penetrating substances which are opaque to ordinary light and they do so in proportion to the atomic weight or density of those substances. A record of this varied penetration can be made on a suitably prepared photographic plate or film.

The oral and dental tissues differ sufficiently in density to permit of their appearing in such relationship to each other that they may be distinguished separately.

It will, however, be readily admitted that the dental tissues are so intimately associated that in order to show them satisfactorily on a plate or film it is necessary to employ a refinement of technique which is not always called for in other parts of the human anatomy.

We must remember that an X-ray picture is a shadowgraph using the X-rays as the source of illumination. Therefore, in order to produce as little distortion as possible, we must establish a definite relationship between the X-ray tube, the object and the plate. It is necessary also that we use an X-ray tube of suitable vacuum in order that rays of a suitable degree of penetration may be obtained. Now, if we take into account the thickness and density of the tissues and the number of milliamperes passing through the tube, we are in a position to determine the length of the exposure.

The angle at which the rays are projected is important. When using a film inside the mouth it is placed with the emulsion side against the lingual surface of the teeth; which means, especially

in the upper jaw, that the film occupies a plane different to that occupied by the roots of the teeth. If we direct the rays from a position too low, we get lengthening of the shadow. If we direct the rays from a position too high, we get fore-shortening of the shadow. The X-rays should strike the film almost, but not quite, at right angles to its surface. In actual practice we bisect the angle made by the plane of the object and the plane of the film and direct the rays so that they will fall at right angles to this bisected plane. Experience and practice are the best teachers of this technique. The use of intra-oral films is indicated where radiographs of small area are required. They are very valuable for this purpose as very clear definition can be obtained and there is no superimposition of shadows.

When larger areas are desired we must resort to the extra-oral method. Plates are used and the required area is brought into contact with the plate by pressing the patient's face against it.

The X-rays are directed through from the opposite side of the skull and the technique employed aims at avoiding dense bony parts which would tend to obscure the desired area. Different operators employ different methods of arranging the patient. Some prefer to have the patient seated in a chair with the head resting on a table or special bracket. The method which has given me best results is to have the patient lying in the recumbent position on an X-ray couch with the head fixed by a special head-clamp. The object in every case is to ensure, as far as possible, absolute immobility of the patient; because the slightest movements, even the movements of respiration, are sufficient to influence the result of an otherwise perfect technique.

The reading or interpretation of radiographs is a subject of prime importance to the dental practitioner even if he does not concern himself with the apparatus and technique employed in their production. The ability to correctly read a dental radiograph requires experience and an intimate knowledge of the normal anatomy and histology of the parts concerned; also a familiarity with the appearance which these normal structures present on the plate or film.

It has been already mentioned that an X-ray picture is a shadow picture which represents the varying density of the tissues through which the rays have penetrated. Any alteration or change in these structures brought about by disease or operative interference is at once evident on the plate. Before we are able to interpret the various abnormalities seen in the radiograph as the result of pathological conditions or operative interference, it is essential that we should have a knowledge of special dental pathology and operative dental surgery.

The true value of a radiograph can only be seen when it is ex-



amined under the proper conditions. The negative should be studied in preference to a print. Much of the detail is lost in prints and lantern slides and more especially in half-tone reproductions for publication purposes. The negative should be placed in a special viewing box which gives a proper diffusion of light, and should be examined preferably in a dark room. A magnifying glass is of great assistance when viewing the small films.

It will be noted on examination of the negative that the denser the part the deeper will be the shadow on the plate. Thus, metallic fillings, crowns, posts and backings appear as transparent areas; gutta-percha root fillings and zinc cements a little less dense; next come enamel, dentine, cementum, compact bone, cancellated bone and soft tissues. The periodontal membrane appears as a dark streak round the root which shows up in contrast to the cementum, on the one side, and the layer of compact bone lining the tooth socket on the other. Unfilled pulp chambers and canals, medullary spaces and foramina in bone appear as dark areas.

The effects of pathological processes on the dental structures, especially those long standing types of infection, is to produce a decalcification and consequent lessening in density of the tissue, or a deposition of lime salts with increase in density. These abnormal appearances can readily be made out when present in a dental radiograph.

Among the pathological conditions which we are called upon to diagnose and treat in the practice of dental surgery periapical dental infections are the most important from a radiographic standpoint, because they often exist in the absence of clinical symptoms, when X-ray examination becomes the principal means of establishing a diagnosis.

The pathology of these conditions has been the subject of investigation by many observers in the past, and recently Mr. Livingston has given us an excellent contribution to the research work on the subject by his paper on "The Histo-pathology of the radicular abscess."

From the point of view of X-ray diagnosis the principal stages of chronic periapical disease are summed up by Ivy as follows:

"1. Chronic proliferative pericementitis, producing a slight thickening of peridental membrane about the tooth apex, but without appreciable loss of bone. In the odotogram this is shown by an increase in thickness of the normal dark line between the apical portion of the tooth root and the bone.

"2. Chronic Rarefying Osteitis with Granuloma. A slow disintegration of bone takes place in a circumscribed area about the tooth apex, the bone tissue being replaced by granulation tissue. The tooth apex may project into the bone cavity, may be shortened or



roughened from irregular absorption of the cementum, or may present enlargements due to hypercementosis. In the roentgenogram these lesions are shown as more or less clearly defined areas of lessened density, *i.e.*, darker than the surrounding bone. The irregular forms of the apical end of the tooth root is also shown when present.

"3. Chronic Rarefying Osteitis with Suppuration. Here we have an area of bone destruction in which the space is entirely or partly filled with fluid pus. The apical peridental membrane is nearly always destroyed, the root end roughened, with the necrotic cementum bathed in pus. The infection in this type of lesion is to be regarded as more active than in the preceding form. The roentgenogram presents a blurred area of somewhat lessened density compared with the surrounding bone, with irregular and ill-defined margins, into which the roughened tooth apex projects. The more active the suppurative process, the more irregular and ill-defined will be the margins of the lesion, the iodontogram.

"4. Chronic Rarefying Osteitis with Cyst Formation. This stage succeeds that of granuloma, the cavity in the bone being filled with fluid and often little soft tissue except a thin fibrous sac. In the roentgenogram, therefore, the cyst appears as a very clearly defined dark area involving the apices of one or more teeth. The margins are regular and very sharply defined, so that there is usually no difficulty in telling exactly where the healthy bone ends."

It may be taken as conclusive that every radiolucent area at the apex of a tooth should be regarded as a potential factor of infection and be eliminated by treatment appropriate to the clinical features of the case and skill of the operator, unless it can be established that the infection has been eradicated by previous treatment and sufficient time has not elapsed for the production of new bone tissue. The bacteriological examination of such areas would be helpful in arriving at a decision. It is also advisable to follow up these cases by subsequent X-ray examinations which could be compared and a note made of the progress of new bone formation.

Chronic suppurative periodontitis—*pyorrhœa alveolaris*. The use of X-ray examination in cases of *pyorrhœa alveolaris* is to demonstrate the extent of tissue destruction, and to guide the dentist in his method of treatment. The appearances seen on the radiograph are very characteristic and, of course, depend upon the stage of the disease.

At the stage when the periodontal membrane becomes involved, the thickening of this tissue may be made out as an increase in the dark streak round the root. The rarefying osteitis which succeeds this is first of all made out by loss of the pointed septum of bone between the teeth. The progressive destruction of bone can be determined at

all stages by a lessening in density of that structure. The hard ring of tartar sometimes present in these cases can be seen, and also irregular appearances of the cementum.

In the interpretation of dental radiographs we should take into account the anatomical relationships of the part concerned. There are certain anatomical landmarks about the jaws which may cast a shadow on the plate in such a way as to simulate the manifestations of disease. In the upper jaw the nasal cavity, the anterior palatine fossa, and the antrum of Highmore show as areas on the plate or film which may be mistaken for extensive necrosis or abscess cavities. The relationship of the roots of posterior teeth to the antrum may be misleading. In the radiograph the roots may appear to communicate with the antrum when in reality they are situated to one side or the other. It requires careful examination of the case to show whether the layer of compact bone lining the tooth socket is intact or not.

Stereoscopic radiographs are often helpful in these cases. In the lower jaw the mental foramen and the inferior dental canal may be mistaken for rarefied areas of disease.

Armed with the information contained in the foregoing brief resume of the interpretation of dental radiographs we are now in a position to take up the consideration of the application of X-ray diagnosis to cases in actual practice.

The appearances seen in lantern slides are the reverse of those seen in negatives. That is to say, the lantern slides show the structures in the same way as a photographic print. The light areas appear dark and vice versa.

In a lantern demonstration of about fifty slides the lecturer next illustrated the uses of X-rays in the following cases in dental practice.

1. *Pyorrhœa alveolaris*. To determine the extent of tissue destruction.

2. As an aid to the diagnosis of apical infections. To determine the amount of tissue destruction and to learn how many teeth are involved.

3. For checking up the different stages of root canal treatment, and as a guide in enlarging root canals for posts. The difficulties experienced in root canal operations are familiar to us all. In difficult cases a radiograph of the tooth taken at any stage of the operation will be found of great assistance. It can demonstrate the direction, shape, and length of the roof, and if a wire is inserted into the canal before the radiograph is taken, the operator can determine the progress which he is making. If the canal is tortuous, it prevents him from making a perforation. If it is a short canal (and we cannot always judge the length by the length of the crown)

he is prevented from going through the apex, and if the canal is unduly long, he is prevented from stopping short of the apex. In brief, the use of X-rays in these cases eliminates a considerable amount of guesswork.

4. To illustrate some of the accidents occurring during root canal operations.

5. To determine the cause of inflammation around bridges. Bridges have been condemned by many operators because of the frequent septic trouble caused by them. In many cases the cause may be ascertained by X-rays.

6. To observe the course of a fistulous tract. Bismuth paste throws a deep shadow on an X-ray plate. Advantage of this may be taken in demonstrating the course and extent of a fistulous tract.

7. To observe the field of operation before and after apiectomy.

8. In cases of delayed eruption to determine the presence or absence of the unerupted teeth, and as an aid to extraction.

9. To determine when to extract deciduous teeth and to observe the stage of calcification of the permanent successors.

10. Fracture of the jaw. To determine the position of the fracture and the degree of displacement, if any.

11. To determine the presence or absence of buried roots.

12. In cases of osteomyelitis to determine the extent of bone destruction.

13. In cases of empyema of the antrum. The investigation of antral disease by means of X-rays is a valuable aid to the other methods of diagnosis at our disposal. The radiograph should be taken postero-anteriorly with the patient's nose and chin pressed against a large plate. By this means both sides can be compared. The antrum of the affected side will appear more opaque than that of the other side. It is also helpful to take films of the roots of the affected side to determine the condition of the roots and bone.

---

## University of Montreal

---

### FACULTY OF DENTISTRY GRADUATES (D.D.S.), 1921.

---

Mrs. F. Abergson, Miss G. Laporta (Antwerp, Belgium). Messrs: W. Allard, M. Astrof, L. Bissonnette, D. Boisclair, D. Bordeleau, S. Brill (Paris, France), G. Ghouinard, G. Fauteux, P. Frécynet, G. A. Gobeille, Arm. Hamel, Ernest Hébert, M. Hudon, René Imbleau, A. Jolicoeur, J. E. Lamontagne, L. Larochelle, R. Laurence, M. Leibovici (Paris, France), J. B. Olivier, L. Perron, J. Prigent, O. Pouliot, D. Rousseau, P. E. Thibaudaeu, O. Trépanier, J. de Montigny, A. Bourbonnais.

(Certified), ENDORE DUBEAU, D. D. S., Dean.



# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## SYPHILIS FROM THE POINT OF VIEW OF THE DENTAL SURGEON.

THIS disease holds special interest for dentists because the buccal cavity and the naso-pharynx are among the commonest sites where the disease manifests itself in characteristic and most contagious forms. At its best the mouth is a septic cavity—the conditions of moisture and warmth being particularly favourable to micro-organismal growth. The lesions of secondary syphilis in the mouth are particularly rich hunting-grounds for that malign organism—the spirochaete pallida. Just as the condyloma in the anal furrow or on the vulvo is particularly contagious by virtue of its extraordinary richness in spirochaetes, so the lesions of secondary syphilis in the mouth, for the same reason, are dangerous sources of infection. Hence, dental surgeons are exposed to great risks of infection. A small invisible abrasion in the epidermis—a scratch from a broken tooth—may afford a portal through which the spirochaete may find its way into the system. It is necessary then, to be ever alert for the immediate detection of syphilis even in the most unexpected quarters.

The lip is one of the commonest sites of the extra genital chancre. Either lip may be affected. The same holds true with regard to epithelioma but its incidence is greater upon the lower lip. Women are affected more than men with lip chancres. The source of infection might be a kiss by a person suffering from syphilis of the mouth, and a necessary antecedent for infection is same lesion—an invisible crack or abrasion will suffice. From four to six weeks is the incubation period. The lesion may be situated at any point on the lip, though often it is near the middle line. It begins as an indolent nodule close to the muco-cutaneous junction. It develops slowly—its surface gradually ulcerating and discharging highly contagious sanio-pus, which may dry on in the form of an unsightly yellowish-black crust. It is elastic and somewhat hard. The subrecutal and submaxillary lymphatic glands are early involved, and sometimes the enlargement of these glands attains very considerable dimensions. The appearances of a completely developed lip-chancr are sufficiently



characteristic to awaken suspicion. It is in the developing, undetermined stage of a simple nodule that the chancre in this situation exposes the unsuspecting dental surgeon to grave danger. It is contagious from the moment of its original inoculation.

Chancres of the tongue are not met with frequently. They may occur in either sex, and are situated as a rule near the tip of the tongue—but they may be met with on the dorsum. They are circular in form and present an ulcerated centre with raised edges. These chancres are much less painful than epitheliomata, and though hard, their hardness is resilient and springy, and they are devoid of that stony character that marks the malignant growth. Chancres of the tonsil are very rare.

It is with the secondary manifestations of syphilis in the mouth that the dental surgeon must be familiar. Among the very earliest of the secondary phenomena of syphilis is sore throat. Often there is no pain associated with the early pharyngeal appearances. They consist of symmetrical kidney-shaped superficial ulcers—sometimes little more than snail tracks, and they may disappear spontaneously. This, however, only occurs during what one may call the period of second incubation—that hiatus of three weeks or so which normally intervenes between the appearance of the primary sore and the outbreak of the cutaneous eruption.

The involvement of the tonsils in the advanced secondary stage presents appearances much more striking. There may be a marked degree of inflammation which spreads from the body of the tonsils to the pillars of the fauces, and even up to the base of the uvula. Extensive superficial ulceration is produced; the edges of the ulcers are a bright red, and their surface is more or less hidden by a yellowish-grey exudation. If this exudate is scraped off, bleeding commences. There is great pain on swallowing—and almost invariably there co-exists a well-marked secondary eruption of the skin.

One of the most characteristic lesions of secondary syphilis is seen on the edge and surface of the tongue—the mucous patch. A mucous patch is characterised by slight swelling, a congested edge and base, and a surface which is usually covered by a thin greyish-white pellicle. An extremely common site for their development is in the inner side of the lower lip, where the labial mucosa is in contact with the mucosa of the gums. The sides of the buccal pouches are also common situations for the development of these patches, and a site of election is the mucous membrane in the neighborhood of the posterior molars. These patches are extremely rich in the specific micro-organisms and are therefore highly contagious. This means that the dentist in the course of his work is exposed to very grave dangers of infection.

On the tongue these mucous patches will sometimes show as a permanent bald patch—a localised depapillary glossitis. Sometimes

the papillae, instead of undergoing atrophy or absorption, undergo hypertrophy, and the hypertrophy may result in a warty growth. The situation of these warty growths is usually the central region of the tongue, in front of the circumvallate papillae, a portion of the tongue which, when that organ is at rest, and the mouth is closed, is least in contact with adjacent parts.

In the late secondary stage, the tongue will often exhibit patches of leukoplakia. Leukoplakia linguae and leukoplakia of the mucous membrane of the buccal pouches are more likely to supervene in a syphilitic who is an inveterate smoker than in a syphilitic who is not a smoker. A patch of leukoplakia consists of a series of small, contagious and raised hard white islands of proliferated horny epithelium. It is a hyperkeratosis. It is not so much an indication of active syphilis, as a sign-post to mark the place where syphilis has once manifested itself. It is non-contagious, but is a degenerative change kept going probably more by the toxins of syphilis, and the irritation of tobacco, than by the actual micro-organisms of syphilis. The danger to the patient is that the cellular proliferation in a leukomatous patch may break bounds and become malignant. It is well to caution such patients very strongly against smoking.

The usual tertiary manifestations of syphilis which the dentist is apt to meet with are ulceration of the palate, gumma of the tongue and tertiary lesions of the lips. Gummata of the tongue are met with chiefly on the dorsum, and frequently near the tip. In size they vary from a pea to a chestnut, and break down ere long, leaving a punched out cavity with crateriform walls and a sloughy base.

Ulceration of the palate may affect the hard or soft palate or both. Syphilitic ulceration is active, rapid, highly inflammatory and often almost phagedenic and frequently attended with great pain. Frequently it will bore through the hard palate in the course of a few days. It is to be observed that herpes will also perforate the palate but its action is slow. Congenital syphilis may also give rise to ulceration of the palate.

From the point of view of the dentist, one of the outstanding features of syphilis is its great contagiousness. The dentist should always make a careful visual examination of the whole of the patient's mouth before operating. This may be easily done without exciting the patient's suspicion. The dentist should be very careful of his hands. An intact epidermis is a very thorough and efficient protection against the invasion of syphilis. Any lesion upon the fingers, however slight, or any little loose tag of skin, such as a hang-nail, ought to be covered up with rubber gloves or finger-stalls. Although the spirochaete is particularly virulent in the mouth, it does not like soap and water, therefore wash the hands frequently with soap and running water. That will kill the spirochaete on the surface of the skin, but if the skin is broken and the infectious matter penetrates the tissues it is best to rub

in for a period of at least five minutes some of Metchnikoff's 33 1-3 per cent. calomel ointment. This will protect from serious danger. If, however, an indolent sore develops upon the finger, immediate treatment should be taken to prevent the spread of the infection.

Careful sterilization of all instruments and anything else that may come in contact with the inner surface of the patient's mouth, is absolutely essential for the protection of those who are undergoing dental treatment. While it is true that the spirochaete cannot long survive on dry surfaces, it is capable of remaining in an active mobile condition for a varying period on a moist surface. They may continue to live for some time on a moist towel. It is important to remember also that the blood of a syphilitic patient in the absence of all outward evidences of the disease, may be capable of communicating the infection.—*Robert W. McKenna, M.A., M.D., B.Ch., The Dental Record, March, 1921.*

#### CHLORAMINE T. AND ITS APPLICATION IN THE TREATMENT OF PYORRHOEA.

**P**YORRHOEA is recognized as a chronic destructive inflammation of the pericementum, accompanied by more or less severe inflammation of the gingivae with disease of the bone around the affected region. The causes of pyorrhoea may be attributed to, first, local conditions, such as chronic irritation from various sources (ill-fitting dentures, distorted articulation, etc.), too vigorous brushing of the teeth and gums with insoluble gritty dentifrices, salivary and serumal calculus; second, general constitutional conditions, such as rheumatism, gout and other systemic derangements.

This disease may commence with a slight loosening of the affected tooth, accompanied by gingivitis. The gums become turgid, and upon slight irritation bleed profusely. With the detachment of the gums from the teeth the irritation becomes more pronounced, and salivary deposits form around the necks of the teeth, especially beneath the free margin of the gums. With the increase of inflammation, pockets are formed. Later pus forms. Absorption of alveolus follows and finally the tooth is lost. Systemic derangements may follow, due to toxic infection of the whole constitution.

In the treatment of pyorrhoea all lost tissue cannot be restored, but as a result of recent investigations it has been proved that the teeth and surrounding tissues can be brought back to a healthy condition, and, with proper daily attention to oral hygiene, can be kept so.

In the search for a method of treatment for pyorrhoea, the effort has been made to find an ideal therapeutic agent—one which would destroy all existing pyogenic and parasitic organisms, converting their poisonous toxins and by-products into inert substances, remove necrotic tissue, and, at the same time, exert a non-irritating healing and tonic effect upon the adjacent delicate structure. It is now well



known that a group of substances (chloramines) studied by Dr. Dakin and elaborated by Dr. Carrel and others, has made possible a new technique in the surgery of suppurating wounds. The killing of micro-organisms by antiseptics is analogous to chemical reactions, one reagent being represented by the antiseptic and the other by the protoplasm of the bacterial cell.

The chloramines are substances containing active chlorine linked to nitrogen in the form of NCI groups. They are all unstable compounds and react in contact with micro-organisms and surrounding substances present in bacteria. The antiseptic action is brought about by the chloramine being brought in contact with the bacterial and other proteins, when the active chlorine is converted into the inert chlorides and inert organic substances in which the chlorine has become united with carbon. This action will continue only so long as there is active chlorine remaining undecomposed, therefore, the best results obtained with the chloramines are by frequently renewed applications. The success of the chloramines in general surgery suggested its possible use in the local treatment of pyorrhoea.

Of the group of chloramines the most suitable for use is the paratoluene-sulphochloramide (chloramine T.) A solution of chloramine T. in water or normal saline solution is quite stable if properly stored, exerts a prolonged antiseptication, is strongly effective when acting in the presence of much blood, and in the presence of inflammation, bacteria and micro-organisms the germicidal activity of the solution is most rapid and pronounced. It is non-toxic and non-irritating, and has a mild solvent action upon diseased tissue. A 1-1,000 solution is more germicidal than five per cent. carbolic acid, and 1-500 destroys staphylococci in two hours. It is a deodorant, promotes healthy granulation, and is altogether the therapeutic agent nearest approaching the ideal. In treatments, a one per cent. solution has been found to be sufficiently powerful for all ordinary purposes.

At the first sitting avoid deep injections into highly inflamed pus pockets. Better to concentrate on thorough cleansing of pus pockets and affected areas, freeing them from food particles, etc. Use the compressed air spray atomizer in conjunction with a mild solution of chloramine T. (about a quarter of one per cent.) After an interval of one or two days a marked diminution of the congestion will be noticeable. Instrumentation to remove calculus may be commenced. Irrigate the pockets with deeper injections, using a one per cent. solution. Use a special irrigator with non-corrosive metal parts. An ordinary all-glass hyperdermic syringe answers the purpose admirably, but this must be fitted with a fine platinum cannula mounted in a platinized mount or nozzle. Isolate the field of operation with cotton rolls. It is necessary to establish dryness of the surrounding parts. Use of hot-air syringe is recommended. Repeat irrigations until all signs of inflammation have disappeared and then complete the in-



strumentation. Use a non-alcoholic solution of iodine as an indicating agent to reveal the deposits of tartar or decay. Conclude each sitting with an irrigation of the pocket. Patient should be instructed in the use of a mouth wash containing a quarter of one per cent. solution of chloramine T., and brush the teeth twice daily with a tooth powder containing one per cent.—*Dr. Hand Osborn, in The Dental Practitioner.*

#### HAEMOPHILIA—A CLINICAL STUDY.

UNTIL recently this troublesome and dangerous disease has been little understood. Even now there are gaps in our knowledge of its pathogenesis, but recent work in physiology has advanced a reasonable theory of causation upon which to base prophylaxis and treatment. Sex appears to play an important part, for although the condition may occur in women it is commoner among males in the proportion of 12 to 1. The mother coming from a family of haemophiliacs hands on the condition to her sons and often through her daughters to her grandsons. Some members of a family may escape or evince only a slight inclination to the condition. Wounds below the neck are less liable to excessive bleeding, nor do small needle punctures necessarily bleed unless made in a mucous membrane. The haemorrhage is oozing rather than copious bleeding and is from the capillaries, not from the arteries, and is not caused from undue fragility of the vascular walls.

The causation of bleeding, generally speaking, may arise: from disease of the vessel walls, from changes in the blood, from delayed coagulation. Sir Almroth Wright has found that if the normal coagulation time is five to ten minutes, that of haemophiliacs is fifteen to twenty minutes or even longer. The blood shows abnormal conditions; there is a deficiency of the polynuclear leucocytes. Formerly it was believed that the bleeding was due to lack of coagulative power, itself arising from some defect in the fibrinogen content of the blood, or to a want of the correct amount of calcium salts. However, we now know that such is not the case. The fibrinogen is normal and if calcium salts are added in vitro to haemophiliac blood coagulation is not determined.

Coagulation is a complex process and the factors as they exist in the blood need to be accurately balanced, otherwise on the one hand effused blood would not clot, or on the other the blood in the circulation would coagulate in the blood vessels and cause the thrombosis. The various substances may be considered to ascertain whether any of them reveal an abnormal state in Laemophilia. Thrombokinase (nucleo-protein which constitutes the nuclei of the cells) is normal, but thrombogen, (otherwise called prothrombin), which is probably derived from the leucocytes and platelets, is deficient in haemophilia. To effect coagulation fibrinogen and thrombogen must co-exist in the

plasma of the blood and act normally, the one to produce fibrin, the other to give rise to thrombin. This last is the fibrin ferment or enzyme. Although thrombin is produced the prothrombin yields it too slowly and hence the delay in coagulation. Anti-thrombin, the body which normally prevents clotting in circulating blood, is not found in excess in haemophilia, so that it is now believed that the weeping from the capillaries arises from the prothrombin failing to supply the requisite amount of ferment in the requisite time.

We have thus a reasonable basis for treatment; the general line to be pursued is keeping the patient in absolute rest, this is to steady and lessen the vigour of circulation and to assist the heart should it be distressed by the anaemia incident to haemorrhage. Pressure is applied locally and with great care that the bleeding points are actually compressed. Normal blood when possible may be introduced below the oozing blood, if this is not ensured bleeding will continue below the clot that is formed. Routine remedies are tannin, alum and perchloride of iron, but as the last is an eschaotic bleeding may recur when the eschar becomes detached. Horse serum obtained in the form of the antitoxin of diphtheria acts too slowly and is of little use. Perhaps the most valuable remedy we possess is Wright's "physiological stypic" or thrombokinase. It consists of one part minced thymus gland to ten parts of normal saline. However, its action is slow, and according to Sir Almroth, it is better to supplement its use by giving calcium salts internally. He orders 60 gr. to adults and 15 gr. to a child in one dose, and follows this by 10 gr. doses three times a day. However, we must remember that after three days the calcium action becomes reversed and so it must be stopped before this occurrence. Undoubtedly when a patient is suspected of haemophilia, prophylactic treatment should be adopted, as the general state of the health influences the character of the blood. Perhaps the most important lesson to be learned is that when routine methods have failed, it is of no use pursuing a waiting policy, as clotting will not occur even when the heart is failing. In this case there is but one remedy, and this must be adopted. The patient must be transfused with normal blood taken from a donor's artery and introduced into a vein of the patient. We know, however, that patients differ as regards their reaction to extraneous blood and it is requisite to obtain a donor whose blood is appropriate to that of the receiver.—*British Journal of Dental Science*.

#### RUSTLESS STEEL.

THE world-famous Krupp works, at Essen, have a dental clinic for the employees. Mr. Hauptmeyer, a director of Messrs Krupp, recently addressed the Central Association of German Dentists and paid tribute to the firm's institute for chemico-physical research. Particular reference was made to the work of Professor Strauss, the discoverer, in 1912, of an alloy of nickel,

chrome and steel which offers a high degree of resistance to the attacks of all kinds of acids. In the Baltic Exhibition at Malmo, in 1914, Krupp's rustless steel was put on the open market for the first time, but only since the war has it been available in bulk for general purposes. Many are of the opinion that this steel, or some modification of it, will in time replace platinum and gold in dental operations. Quoting from the description of this alloy, as given by the discoverer: "Krupp's rustless steel offers the dentist a metal able to stand, both technically and hygienically, side by side with gold and platinum. It will take a high polish and it exhibits a high degree of resistance to all kinds of corrosion. In the matter of stability, it is superior to both of these metals; and it is considerably cheaper. Upon the application of this steel to dental mechanics will follow notable social developments in the world of dentistry. The material in its present form is difficult to work, and our laboratories must therefore largely substitute machinery for hand labor. Rustless steel cannot be used to the fullest advantage without the help of the engineer. With his help, it should be possible, in the near future, to carry the working of steel into the smallest laboratory."—*The Dental Record*.

#### CAST CLASPS.

THERE are some fundamental principles regarding clasps in general that should be better understood. It is a well-established fact that an accurate fitting clasp affords a much better frictional bearing on a tooth than one which only touches in a few places. It is also less in the way of the tongue, and food does not pack in between the tooth and the clasp during mastication. It must also be remembered that the ideal clasp not only affords the means of retention of the artificial substitute, but is also constructed so as to afford a certain amount of stability to the forces of mastication, and acts as an aid to the saddle in resisting the stress of occlusion.

The heavy, strong, snug fitting cast clasp, when placed in proper relation to the saddle, is the most efficient and in every way the most satisfactory. In using the cast clasp a certain amount of care must also be observed in selecting the most favorable conditions. Rigid attachments should never be used in cases of recent extractions where the extension saddle is to be employed. The rigid attachment can be used in cases having abutments at both ends in recently extracted cases, providing provision is made for the re-fitting of the saddle as absorption takes place. This condition is best brought about by using vulcanite saddle, so they can be refitted easily. Occlusal stays are very essential in all cases as a means of retaining the clasp in a definite position. In the construction of the cast clasp, the natural anatomical occlusal construction of the tooth is taken advantage of in order to afford a firm seat for the clasp. A reciprocal bearing of



the clasp on the tooth is also absolutely essential, otherwise the clasp will act as a regulating appliance, loosen the tooth and move it in the direction of the pressure exerted. The clasp must encircle the tooth so that it will be held firmly and the force of mastication be properly distributed on the tooth as it was before the clasp was used. In using the cast clasp and saddle the two should be so made and assembled as to give a proper co-ordination between them, with the result that both the saddle and the clasp will receive a certain amount of the force of mastication. If too much stress is borne by the tooth from the use of the clasp, it will result in the tooth being prematurely lost, and if the saddle receives too much force of the mastication it will result in an improper restoration of function or masticating efficiency.

In the use of cast clasps it must be remembered that they fit the teeth very accurately, and it becomes absolutely imperative that the partial plate should be left out at night and the denture teeth thoroughly cleaned in order to avoid any possibility of decay. Decay of the teeth to which clasps are fitted is sure to occur if they are neglected, but if given proper care the teeth with clasps suitably fitted to them are less liable to decay than the same teeth in the average mouth under ordinary conditions.—*Dr. F. E. Roach, Journal of the N.D.A.*).

#### A SUBSTITUTE FOR PRECIOUS METALS IN THE ENLARGEMENT OF THE ALVEOLAR PROCESS BY THE LINGUAL WIRE.

**D**R. R. ANEMA, Paris, France, uses a wire for expanding arches of such an unusual type as to arouse much interest.

The special feature of the wire is that it is made neither of iridis-platinum, nor of elastic gold, but of the non-precious metal nichrom. It may also be made of hard German silver. The German silver is obtained by drawing it cold through the draw plate.

Instead of soldering the wire with silver or gold, which would diminish its elasticity, it is soldered with tin, and in this way its elasticity is maintained. As a matter of fact, soldering with tin, if carefully done, does not lessen the elasticity of the wire. The soldering must, of course, be carried out with all requisite precautions to cleanliness, care being taken to give a certain thickness to the tin solder, or even pure tin, that may be used, though the latter requires a higher temperature. A considerable mass of tin solder or tin must be used, otherwise on nipping the wire with pliers, it may become detached from the bands. Tin causes no inconvenience to the mouth, neither is it detrimental to the health. It is true that it slightly discolors the surrounding teeth, but such discoloration is easily removed.—*The International Journal of Orthodontia*.





## Chicago to California and Return

*(Continued from the April issue.)*

After reading my paper before the Los Angeles County Dental Society I took the train that same night for San Francisco. There is always magic in that place for me. It was the port of arrival when I came from Australia some years ago, and after so long a voyage it was like heaven. Then the men of San Francisco are so hospitable and entertaining that it is a pleasure to go among them. I was met at the station by Dr. Carlton of Oakland, Dr. Hall of Berkeley, and Dr. Avary of San Francisco.

When I stepped into my room at the St. Francis Hotel I found it decorated with flowers from members of the profession, and a fine basket of the choicest products of California in the way of fruits, nuts, etc., from the manager of the hotel, Mr. Coleman. Evidently some of my San Francisco friends knew Mr. Coleman, and intimated to him that I was a lone pilgrim wandering over the face of the earth, and it might be an act of charity to make me feel at home, as I always do at the St. Francis Hotel. I also found in my room a card of the chief clerk with the intimation that if he could be of service he would be delighted, and inside of fifteen minutes the assistant manager called up to know if there was anything he could do for me. In the language of the enthusiastic street Arab, "Gee whiz!!—this was going some." After that, you could not drive, bribe, or dog me into any other hotel in San Francisco but the St. Francis. My entire stay there was made most delightful and comfortable, but of course I was not foolish enough to imagine that this solicitous attention came through any virtue of my own. It was all due to the subtle workings of those master minds, my dental friends of San Francisco.

In the afternoon I was taken across the bay to Oakland and Berkeley by Drs. Hall and Day and driven around the University grounds, winding up in the evening at a dinner and meeting of the Alameda County Dental Society, in Oakland. This meeting was not on my schedule—in fact I knew nothing about it till my arrival in

San Francisco—but the regular essayist of the evening was generous enough to step aside and insist that I read the paper I had presented before the societies in San Diego and Los Angeles. I have never in my life worked a paper as hard as I did that one. I met many old friends at this meeting and made new ones, and the evening passed off most pleasantly.

The following morning Dr. Hugh Avary called at the hotel to drive me out to the University of California Dental Department, where I had an invitation from the Dean, Dr. Guy S. Millberry, to speak to the students. To me it is always an inspiration to face a class of students. Dean Millberry had very generously suspended the regular class work, and assembled all four classes in the Amphitheatre. What a fine body of young men and women they were. I apologized to them for being the means of taking them away from their regular work, and intimated that I knew from experience how very much a class of students usually take the matter to heart when their routine work is interfered with. From the expression on their faces I am convinced that they willingly accepted my apology—students are always most generous in a situation of this kind. My meeting with the teachers and students of this institution was exceedingly enjoyable in every way, and the reception they gave me will long live in my memory. Dean Millberry is doing a wonderful work in the way of dental education at the Coast, and it was a fitting recognition when the Institute of Dental Teachers elected him as President at its recent meeting in Indianapolis. It is such men as he who are today upholding the best traditions of our profession, and so long as dentistry has men of this type in its ranks there need be no concern for the future.

That afternoon I had a rare treat. My old friend and former student, Dr. Roscoe Day, drove me around San Francisco and its environs in his car, and showed me the city in a light that I had never seen it before. It was one of those rare clear days that are a delight to the soul, giving us an unusual view of Golden Gate and the ocean without the interference of fog. We drove up to Cliff House and saw the lazy old sea lions basking on the rocks, and watched the breakers lashing the shore. We went through Golden Gate Park, and up to Twin Peaks, where we were afforded a most wonderful view of the city.

There is a fascination and charm about San Francisco that sets it apart as a city by itself. One continually thinks back to the days when the discovery of gold brought the hardy old forty-niners to its gates and placed San Francisco on the map. It has formed the great link between the Orient and America—in fact I once heard a speaker say: "San Francisco is so far west that it is east." It is famed in legend and story, and there is a romance about it all its own. Long live San Francisco!

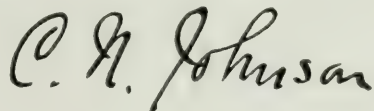
For years there have been rumors of rivalry between Northern

and Southern California, but I was assured when I landed in Los Angeles that this was a thing of the past. I was told that today it is just California, with no North and no South—even as we so frequently hear of this whole United States that there is no longer a North and a South. Undoubtedly the sensible people of California and of the United States are trying hard to wipe out sectional lines and pull together instead of apart. But once in a while some ill-advised person forgets that the world is advancing and that sentiments are changing, and so he breaks loose with an outcropping of sectional prejudice that fits into the scheme of the dark ages better than it does into that of today. After drinking in with the best of relish all the assurance of harmony in California, the very first San Francisco paper I picked up had this as the opening sentence of an editorial:

"The people of California are beginning to realize how delinquent they have been in permitting the energetic people of six or seven other counties, mostly desert, to do all the advertising of the glories of this magnificent State." Shades of the eternal—"mostly desert"!! Ladies and gentlemen, I rise to solemnly ask what the people of Southern California are likely to say to *that*? I can only hope that they have not read it.

But California—north and south—are most lovable, and I look for the day when the lion and the lamb shall lie down together (Possibly, as our friend, Dr. A. W. Thornton, would say, it will only be when one is inside the other.)

Next month I will say something about Utah and Salt Lake City.



---

### Michigan State Dental Examination

---

THE next examination for candidates to practise dentistry in this state will be held by the Dental Examining Board at Ann Arbor the week of June 20—25 inclusive. The examination starts at eight o'clock sharp on the first day. The candidates must have credentials in the hands of the Secretary ten days previous to this examination. For all further information, application blanks, etc., address E. O. Gillespie, Sec., 1541 David Whitney Bldg., Detroit, Mich.



## Obituary

### GEORGE ALEXANDER BOWMAN, D.D.S.

Twelfth President Mohawk State Dental Association.

*Written by Burton Lee Thorpe, D.D.S., Kansas City, Mo.*

GEORGE ALEXANDER BOWMAN, son of Joseph and Asenath Bowman, was born at Barnard, Vt., June 6, 1839. His early boyhood was spent on his father's farm. He attended the common school in his native village, and also had an academic course at Royalton and Newbury, Vt. Dr. N. W. Gilbert, an itinerant dentist, visited his father's home; his exhibition of a case of fine dental instruments and some skilful dental operations, in which young Bowman was interested, was the incentive that led him into dentistry. He entered the office of Dr. Gilbert, of Lowell, Mass., October, 1857. A year's tutelage with him and Dr. H. N. Roberts, of Ludlow, Vt., was deemed sufficient to enable young Bowman to open an office at Canton, St. Lawrence County, New York, October 8, 1858, where in company with his brother, the late Dr. J. A. Bowman, of Minneapolis, he practised until September 20, 1862, when he came West, locating at St. Anthony's Falls, Minn. (now East Minneapolis). Here he stayed a year and a half. In May, 1865, he opened an office in Milwaukee. This he sold in October, and came to St. Louis, arriving November 9, 1865, first becoming associated with Dr. Isaiah Forbes, with whom he remained four years. Here he practised until 1918 when he retired. He assisted in organizing the Missouri Dental College, chartered September 16, 1886, in which he was the first demonstrator of prosthetic dentistry, and for years a member of the Board of Trustees, and of the Clinical Staff. From this institution he received the D.D.S. degree February 22, 1867, at the first commencement exercises. He and Dr. A. W. French, of Springfield, Ill., were the only members of this class, and the oldest graduates of the school. He was President of the Missouri Dental College Alumni Association in 1891. Dr. Bowman joined the Missouri State Dental Association June 4 1867; was its Secretary 1870-1-2, Vice-President 1875, and President 1876. He was President of the St. Louis Dental Society in 1873. He was an honorary member of the Illinois and Iowa State Dental Associations, and President of the St. Louis Society of Dental Science, 1908. If Dr. Bowman was anything he was both an optimist and enthusiast. Always ready to learn from the humblest member of the profession and equally ready to instruct. He was always experimenting with the new things in dentistry. Of an ingenious turn, Dr. Bowman invented a number of useful instruments, amongst them a gum retractor, which preceded the present rubber dam clamp. This was put on the market by the S. S. White Co., also an improved clamp forcep, manufactured by S. S. White Co., and known as the "Bowman-Allen forcep," as well as a mouth mirror and cheek retractor. He was the first to use gutta-percha root canal points. With an exceptional skill as an operator, he has done much to ornament and enhance his profession. His operations were all of the highest order of excellence.

He was married March 17, 1864, to Miss Jennie E. Homer. To them were born George Homer, Birdie Bell. (D.D.S.), Jennie Elizabeth, Grace Adelle, Paul Homer, Ariadne Josephine and Florence Hope.

In politics Dr. Bowman was a Republican. He had no church affiliations, believing in "the fatherhood of God and the brotherhood of man" in the true sense of the word. In secret societies Dr. Bowman had been a "jiner." He was a Knight Templar of the Masons, a member of the I.O. O.F., Knights of Pythias, Royal Arcanum and Legion of Honor, in all of which he had filled the highest offices, and been prominent in the ritualistic and dramatic work. Possessing a fine tenor voice, he sang for twelve years in St. Louis church choirs, also took a prominent part in amateur operas, oratorios, etc. He was a member of the old Philharmonic Society and of the Oratorio Society, as well as of the St. Louis Club and the St. Louis Jockey Club.



The St. Louis Society of Dental Science, of which Dr. Bowman was President, 1908, in recognition of his long and useful career and his contributions to dental surgery, gave a dinner in his honor on his golden jubilee at the Jefferson Hotel, October 8. Dr. Burton Lee Thorpe responded to the toast, "Our guest and why we honor him." Dr. Thorpe presented, on behalf of the Society, a beautiful loving cup.

Dr. Bowman's death, on April 2nd, 1921, came so peacefully that it was like a benediction in the passing of his lovable spirit.

---

## Septic Bridgework

---

As to septic dentistry, I want to say that a well-constructed fixed bridge is far less septic than most of the removable or movable-removable bridges, with their tubes, joints and box attachments to the teeth or roots.

This does not mean that I want to condemn removable bridge-work. I simply point out to you some of the erroneous conceptions of this removable bridgework craze.

Dentists who have made bad fixed bridges in the past, will also make bad removable bridges. For years past, I have devoted my entire time to this line of work. My practice is limited to bridgework. For twelve years I conducted college clinics and received bridge patients from all parts of the United States, from other dentists, and with the knowledge gained of fixed and removable bridgework, observing the results of my own and that of other men's work, from all states of the Union, I am able to form this conclusion.

I must honestly confess that I do not see in the removable bridge-work the remedy for all the ills and the shortcomings that have been laid at the door of fixed bridgework. We have to look further and correct many of our erroneous views on this subject to help the profession and the public.—*J. F. Hovestadt, D.M.D. (Dental Items of Interest).*

---

REMOVAL OF FACINGS.—It sometimes becomes necessary to again solder on the work after the facings have been cemented to place. This may be done after the facings have been removed. Place the bridge over night in concentrated ammonia water. It will combine with the phosphoric acid and the cement will disintegrate.—*F. W. F., Pacific Dental Gazette, Dental Cosmos.*

BRUSHING THE TEETH.—There is no more important subject than teaching definite methods of tooth brushing. If we teach different methods the public will lose confidence in us. It is high time we lose our tooth-brushing hobbies—we all have them—and when we understand one another we shall probably find that we are not so far apart after all. Possibly a most important point would be to standardize the tooth-brushing methods.—*N. S. Hoff, D.D.S., in Journal of the N.D.A.*

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, MAY, 1921

No. 5

## EDITORIAL

### The Pre-Dental Requirement

AT the last meeting of the American Institute of Dental Teachers, the President, Dr. Arthur D. Black stated that sixteen colleges had announced that the Pre-Dental standard would be required of all students commencing Session 1921-22. Dr. Black, throughout his address, gave expression to the value and need of the so-called Pre-Dental standard in such words as: "None will question the advantage to the Dental student of one year or more of liberal Arts. . . . The Dentist should have the same basic education as one practising any of the specialties of Medicine. . . . The mouth is only a small part of a tremendously complicated and very sensitive machine. . . . I deplore the fact that Dentists are not now receiving a more thorough training in the fundamentals of Medicine."

We may well ask whether our colleges are training students to look at the entire system or at the teeth alone? Are our students prepared at graduation to practise Preventive Dentistry, as well as Reparative Dentistry? Do our students leave college with a scientific knowledge of fundamentals that enables them to practise as *DENTAL PHYSICIANS*, as well as *DENTAL SURGEONS*?

Many Dentists seem to believe that the practice of Dentistry is solely the replacing of lost tooth tissue by artificial substitutes. To such the subjects of Biology, Histology, Chemistry, Physiology and

Anatomy are of secondary importance. But, in the light of present day requirements, these subjects are primary and fundamentally important. From the pathological standpoint, as well as from the physiological, the modern Dentist, if he is to render efficient service, must have an intelligent conception of systemic as well as local conditions.

Medical and Dental service is a personal service, and we cannot over-estimate the influence of the members of these Professions upon their community. Their education and viewpoint should be of the broadest character. Important, however, as the cultural advantage of Pre-Dental work is, this of itself does not justify the extra year's work. Justification lies rather in the vital need for an extra year in which the fundamental science subjects will be taught.

Is the Pre-Dental work better given in a College of Liberal Arts or a Dental School? Owing to the unusual influx of students following the war, a Pre-Dental Class was formed in the Dental College at Toronto last session, to accommodate those who desired to commence their course, but for whom no room could be found in the Freshman Class. After two years' experience it is the judgment of the Faculty that the Pre-Dental work, given in a Dental College, is entirely successful. This session the seventy-five Pre-Dentals in attendance at the Royal College of Dental Surgeons are enrolled, in effect, in a five year course. The College, however, accepts as the equivalent of the Pre-Dental Year, Arts College or University year, providing the Pre-Dental subjects have been successfully covered.

The Pre-Dental subjects include English, French, Physics, Chemistry, Biology, Modelling and Art. Consideration is being given to the question of adding short courses in manual training, shop work, and mathematics applied definitely to Dentistry, particularly systems of measurement, geometrical drawing, etc. In Modelling and Art the course is made of definite value to Dental students by modelling in clay the head and neck and reproducing the individual teeth. The Art course, including the whole subject of color, is given direct application to Dentistry.

Among the advantages of the Dental Faculty controlling Pre-Dental work are:

1. The Science subjects are taught with special reference to Dentistry.
2. The work is correlated with the Dental curriculum and the entire class is taught uniformly.
3. The cultural subjects may be just as well taught as elsewhere by having the right teacher come to the class.
4. Readjustment may be made in the present Dental curriculum by shifting from the present course some of the Science work to the Pre-Dental year, with a view to making the fifth year a hospital, infirmary and clinical year, with opportunity for students to specialize in some branch of Dentistry, should they so desire.

In other words, to let the extra year have the effect of developing better Dentists, as well as better citizens.

5. There is a lack of uniformity in Science courses as given in Arts Colleges.
6. In many localities it is quite impossible for students to secure Pre-Dental work in one session. For instance, in the High Schools of Ontario, Honor Matriculation standing is frequently extended over two College years.

Where the Dental and Arts Faculties of a University are in close proximity, such as Ann Arbor, Minnesota, and Iowa City, the Dental Faculty may send Pre-Dental students to the Arts Building for some of the work, or may arrange that the Arts Teachers become members of the Dental Faculty and be required to attend Faculty meetings. Whether the Arts work is taken in this building or that, is not vitally essential. The determining factors are the size of the class and the local conditions. The more difficult problem to determine is in those cases where the Dental Faculty is far removed from the Arts Faculty. Under such circumstances the Pre-Dental student will doubtless lose from the cultural standpoint, but gain more in practical training, by having the year's work given in a Dental Faculty.

We believe there will be an important permanent result in a perceptible improvement in the general character and standing of the whole undergraduate body, through the adoption of the Pre-Dental Standard.

---

## Plaster of Paris as an Impression Material

---

IT has been said that we have a moulder's job when we attempt to get an impression which will produce a cast that is a perfect reproduction of the jaw to be covered by the denture. In my estimation plaster of Paris properly mixed is the most yielding material that we have. It has no rival when we want a perfect mould. It is almost impossible to get a perfect impression with modelling compound, because the compound will not flow to place, but must be pressed to place, and thus will displace soft tissue, therefore it should be used for the tray. If this tray is properly trimmed we can get a perfect impression by using a creamy plaster, properly mixed, because thin plaster will conform to tissue without being forced to place as you are required to do in handling the modelling compound. By the use of plaster we do not need the so-called closed mouth impressions.—George P. Brenner, *Journal of the N. D. A.*, per *Dental Cosmos*.



THE Golden Rule is coming into its own. The Rule of Gold has had its day and it has been a failure. It has led us into chaos, war and destruction. The Golden Rule will lead us out of this world-wilderness of ignorance into the sunlight of truth and happiness.—*Selected.*



G. R. ANDERSON, M.A., TOR., A.M. HARV.

*Professor of Engineering, Physics and Photography,  
University of Toronto.*

*Professor of Applied Physics, Royal College of  
Dental Surgeons of Ontario.*

*Professor Anderson has been associated with Dr. H. K. Box  
in the production of photomicrographs illustrating Dr. Box'  
work on the Histology and Histo-Pathology of the Dental Tis-  
sues. Professor Anderson has also rendered splendid service to  
Dentistry in the Department of Applied Physics.*

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, JUNE, 1921

No. 6

## Diet in Relation to Oral Hygiene

BY WALLACE SECCOMBE, D.D.S., TORONTO, CANADA.

*Professor, Preventive Dentistry, Royal College of Dental Surgeons.*

THE following copies of lantern slides were shown by the author at the meeting of the National Dental Association in Boston, August, 1920, and are published in ORAL HEALTH by courtesy of the Journal of the National Dental Association. Comments were made by the author while each slide remained on the screen, and at the conclusion of the paper, Drs. De Witt Cross and Percy Howe, of Boston, and Thaddeus P. Hyatt, of New York, took part in the discussion.

Slide 1

### PREVENTIVE DENTISTRY.

**Dental Disease**—Most prevalent disease afflicting civilized man—the more civilized the race, the more dental disease.

**Preventive Dentistry**—A boon to humanity—one ounce of prevention better than a pound (16 ounces) of cure—advantage sixteen times greater.

### Six Reasons for Prevention of Dental Disease.

- 1st—Lost tooth tissue not restored.
- 2nd—Substitute materials are inferior.
- 3rd—Pain and expense are involved.
- 4th—Serious systemic lesions result.
- 5th—Infected areas often inaccessible.
- 6th—Cure frequently impossible, resulting in entire loss of tooth.

*(Read before National Dental Association, Boston, Massachusetts, and Canadian Dental Association, Ottawa, August, 1920). . .*

## Slide 2

**LOSS OF TEETH A SERIOUS MENACE.**

- 1.—Masticatory efficiency impaired.
- 2.—Elongation of opposing tooth.
- 3.—Tipping of teeth either side of space and bodily drifting.
- 4.—Resorption of surrounding tissues.
- 5.—Prosthetic restorations inferior to nature, from standpoint of utility and esthetics.

**SAVE THE TEETH.**

The uncertainties and difficulties of dealing with dental focal infection seem to constantly increase—Apical infection is a sequela of dental disease—Therefore **DENTISTRY'S REAL PROBLEM** is **PREVENTION**.

**Practitioners who Render Modern Dental Service** concern themselves with the **Cause** as well as the **Cure** of dental disease. They are both **DENTAL PHYSICIAN** and **DENTAL SURGEON**.

## Slide 3

**The Problem of****IMMUNITY AND SUSCEPTIBILITY**

to dental disease is most complex. Many factors (about which we know comparatively little) are concerned, and these usually operate in conjunction. The process of fermentation, simple enough in laboratory, becomes involved with many other influences when carried on in the oral cavity.

**IMMUNITY.**—Normal healthy individuals, living physiologically and possessing dental organs perfect in quality, form and arrangement, are immune to dental disease.

**SUSCEPTIBILITY.**—Every deviation from normal, in either anatomic form or habits of living, predisposes to susceptibility.

**Nature's Immunizing Forces Frequently Overcome Disintegrating Factors—In Majority of Cases, However, under Modern Methods of Living, Dental Disease Occurs.**



Slide 4

**Factors Influencing  
SUSCEPTIBILITY and IMMUNITY  
may be divided into two classes:**

- 1.—ANATOMICAL—The inherent qualities of the tooth and its relation to other teeth.
- 2.—ENVIRONMENTAL — Influences surrounding the tooth and operating from without.

All factors involved, however, though discussed as separate questions, are intimately related. Each in some way affects the other.

For instance:—

Anatomy	}	affect	mastication.
Food			
Mastication—	affects	}	anatomy.
Food—	affects		digestion.
Digestion—	affects		saliva.
Saliva—	affects		oral cleanliness.
			digestion.
			saliva.
			oral cleanliness.

Thus we may and do have many vicious circles established, making the primary cause of Dental Disease difficult to identify.

Slide 5

**DENTAL DISEASES.**

**PERICLASIA** (Path of infection, tissues surrounding tooth).—

Howe has shown relation of systemic conditions to Periclasia—tissue alteration primary cause, bacterial invasion secondary—infection preceded by chemical or mechanical tissue disturbance.

**CARIES** (Path of infection, pulp and root canal).—

Dissolution of tooth, resulting from acid, By-product of carbohydrate fermentation, retained in contact with tooth. Acid is retained and protected from dilution in the saliva by reason of mucinous film or anatomic fault.

**THE MOUTH**—Ideal incubator—bacteria always present to cause fermentation or putrefaction when suitable pabulum offers.

In both Periclasia and Caries important factors involve questions of

**MASTICATION, DIET and DIGESTION.**

## Slide 6

## DIET IN RELATION TO DENTAL DISEASE.

The oral cavity—an integral part of the Digestive Tract—cannot be considered as something apart.

The teeth constantly bathed in saliva, one of the digestive juices, the character and composition of which are constantly influenced by dietetic and digestive considerations.

The increased incidence of Dental disease and diseases of the Digestive Tract has occurred simultaneously, and is doubtless of common origin.

The Digestive Tract has been compared to an extensive chemical factory, composed of a series of passages and compartments, in each of which the food (according to its properties) is retained for a time or sent on at once to the next. Each compartment is provided with suitable reagents. The food is finally brought into a condition in which it is capable of being absorbed into the body fluids and built up into the tissues.

## Slide 7

## THE ALIMENTARY CANAL.

is about 30 feet long, of which only 3 inches (the mouth) are under the control of the will. **With the exercise of proper control (both food and mastication) over the voluntary 3 inches, little concern need be given to the involuntary 30 feet.**

## THE ORAL CAVITY.

Intelligent Control of this portal of entry will bring about the operation of nature's forces of resistance. This not only predisposes to mouth health, but to the elimination of most of the diseases of the digestive tract, including stomach, liver, kidneys, and intestinal disturbances.

## Slide 8

## FOOD.

Foods are divided into four groups:—

- |                    |                                      |
|--------------------|--------------------------------------|
| 1. Carbohydrate .. | } Energy producing.                  |
| 2. Fats .....      |                                      |
| 3. Protein .....   | } Tissue forming, Repair waste.      |
| 4. Inorganic ..... |                                      |
|                    | } Bone forming<br>Neutralize acidity |

**Fermentation.**—The carbohydrates (Carbon with Hydrogen and Oxygen in same proportion as in water), break down by fermentation with formation of acid by-product. Associated in mouth with caries.

**Putrefaction.**—The proteins (Nitrogenous), break down by putrefaction with alkaline end-product and putrid odor. Associated in mouth with periclasia.

A diet may be right in quantity, but contain too little of one food and too much of another, i.e. "out of balance."

## Slide 9

A **Balanced Diet** is one containing sufficient of each of these elements.

Amount of each element required to give balance varies according to age, temperament, mode of living, energy expended, and climate.

For instance,—

Two children in same family partaking same diet, one susceptible to caries,—other immune. Amount of energy expended, makes diet right for one and wrong for other.

There may occur over-ingestion of a balanced diet, or, more unfortunate still, over-ingestion of an unbalanced diet.

Harold Clark has shown that over-ingestion is more frequent where sugar, jams and sweetened deserts are taken freely.

Kirk claims that **over-ingestion of carbohydrate** makes it impossible for blood, muscles, liver, to store sufficient of this element in metabolic form, with resultant overflow and presence of **metabolic carbohydrate in saliva**.

Carbohydrates are necessary to supply body energy, but if over-ingested satisfy hunger without supplying other essential food elements.

## Slide 10

### FOODS CLASSIFIED.

Most foods contain some of each of the four elements. Foods are classified, however, according to element that predominates.

#### CARBOHYDRATES

Vegetables (ex. Veg. Pro.)  
Grains (cereals, rice, flour).  
Fruits.  
Sugar (very concent.) Con-  
fections, Syrups, Honey,  
Jams, Marmalades,  
Cakes, etc.

#### PROTEINS (Animal)

Meat  
Fish.  
Fowl.  
Eggs  
Cheese.

#### (Vegetable)

Peas.  
Beans.  
Lentils.  
Nuts.

#### INORGANIC—

Vegetables.  
Fruits.  
**Greens.**  
Bran (in whole wheat).

#### FATS—

Meat Fat.  
Nuts.  
Veg. fats.  
Cream.  
Butter.

#### WATER.

Milk contains elements of each class.

## Slide 11

Take some food indicated in each group at each meal. Use sugar or its combinations in great moderation. Use cereals and bread moderately. Use fruits, vegetables, greens, etc., liberally.

Even a sandwich may be so prepared as to contain one food of each class.

For Instance:—

Carbohydrate	Fat	Protein	Inorganic
Bread	Butter	Egg or Meat or Nuts or Cheese	Lettuce

## Slide 12

Authorities are agreed that in modern life there is a serious over-ingestion of carbohydrate foods, and particularly of sugar.

**SUGAR CONSUMPTION.****In United States Sugar Consumption Has Increased 500% in 50 Years:**

In the year	1865	18 lbs. consumed per capita
" " "	1875	45 " " " "
" " "	1885	54 " " " "
" " "	1895	62 " " " "
" " "	1905	75 " " " "
" " "	1918	77 " " " "
" " "	1919	93 " " " "

**Dominion of Canada Sugar Consumption:**

In the year	1919	95 lbs. consumed per capita
-------------	------	-----------------------------

Countries with lower sugar consumption suffer less from Dental disease. Government statistics indicate that over-ingestion of sugar is most marked in English-speaking countries where Dental disease is most prevalent.

Ninety pounds of sugar is an average of four ounces per day. A man working hard in the open air can barely consume (oxidize) that amount.

The sugar is a concentrated food, and used in excess, irritates the digestive organs.

In refining sugar the mineral elements so valuable to the human body are entirely removed. For instance, sugar refined and as found in beets.

## Slide 13

**INORGANIC ELEMENT.**

Quality of tooth not permanently fixed—teeth osmotic—resistance to disease affected by both systemic and local conditions.

Bunting has shown greater susceptibility where calcium content of saliva comparatively low.

Inorganic constituents of body may be increased by diet high in these elements, such as fresh vegetables, skimmed milk, and buttermilk.

High calcium content of saliva tends toward maintenance of hard surface of teeth.

Special necessity for diet high in inorganic content, during developmental period—diet of mother during pregnancy particularly important.

## Slide 14

**Case Reported by Department of Preventive Dentistry, Royal College of Dental Surgeons.**

Child 12 months, breast fed, teeth normal at eruption almost denuded of enamel, marked gingivitis, vomit after every feeding daily since birth.

Analysis of mother's milk showed high sugar content and low in protein.

Mother's diet confined entirely to bread, cakes and jam with from 12 to 15 spoonfuls of sugar a day in tea and coffee. Very little protein and no mastication. Similar history 4 previous children.

Normal mothers' milk is certainly best. Bottle feeding preferable, however, in case such as above, providing food scientifically prepared and jaws exercised in feeding.



Slide 15

**R.C.D.S. CASE REPORT**

**Analysis of Mother's Milk.**

	Analysis	Normal (Blythe)
Sp. Gravity .....	1.0308	
Water .....	87.9	88.
Total Solids .....	12.1	12.
Fat .....	3.35	2.9
Proteins .....	1.13	3.
Sugar (Lactose)....	7.36	5.87
Ash .....	.26	.16

Unbalanced Diet for Child, result,—Dental Disease.

Slide 16

**Disadvantages of those Carbohydrate Foods Resulting in Excess of Acid End-Product in the**

Namely, **THE CEREALS** (seed products), including bread, cakes and flour products.

**BECAUSE—**

- 1st.—When mixed with saliva they become particularly sticky and particles have a tendency to cling to the teeth—(Alimentary Carbohydrate).
- 2nd.—Over-ingestion may lead to insidious return to the mouth of carbohydrate elements—(Metabolic Carbohydrate).
- 3rd.—Modern milling methods eliminate vitamins and important inorganic elements.

Slide 17

**ADVANTAGES OF FRUITS, VEGETABLES AND FOODS HIGH IN INORGANIC ELEMENT.**

- First.**—Local cleansing action of fruit acids and fibrous vegetables.
- Second.**—Aid digestion and peristalsis.
- Third.**—Have basic end-product,—maintain calcification of osseous tissues.
- Fourth.**—Saliva higher in calcium content,—alkalinity increased.
- Fifth.**—Predisposes to maintenance of hard surfaces of teeth.
- Sixth.**—Contain vitamins.  
**Tissues,**

Slide 18

### ACCESSORY FOOD FACTORS. (Vitamines)

Diets composed of **chemically pure** proteins, carbohydrates, fats, and inorganic elements,—result in disease and death of experimental animals.

In other words, **synthetic milk** does not contain certain vital factors essential to health and growth, and whose presence may be determined only by Biological methods. Analysis may show **natural milk** and **synthetic milk** precisely the same from the standpoint of **chemical composition**, but there is a vital difference.

These essential biological factors are known as "Accessory Food Factors" and are popularly called "vitamines."

In modern foods these vital factors are removed or destroyed during the process of manufacture, notably in the case of **white Flour**, and **Gelatine Desserts**. Thus, a meal composed of White Bread, cake, sugar, manufactured desserts, tea, coffee, is entirely lacking in these essential elements.

Slide 19

### USE ALL PARTS OF PLANT.

McCollum has shown that "whole grain" is not sufficient, but it is necessary to include **all parts** of the plant in a **balanced diet**, namely,—

Leaf, Seed, (tubers), Root. Each contains elements lacking in the other, and supplies necessary "bulk of food" less concentrated.

**Vitamines are contained in:** Meat, Milk, Eggs, Fresh Vegetables, Whole Wheat.

Milk and leaves of plants should never be omitted from the diet. The latter include Spinach, Celery, Lettuce, Cabbage, Chard.

Slide 20

### PLAQUE FORMATION AND MUCUS.

**Body Lubricant.**—Assists in formation of bolus of food and deglutition.

**Body Protective.**—

When irritant or noxious material swallowed, increased flow of mucus occurs. Pavlov reports 100 times the normal amount of mucus secreted by mucous membrane when surface of stomach irritated by potent reagent. Thus tissue cells are protected and noxious substances are diluted or new combinations formed.

Indigestion (over-ingestion, bolting of food, over-ingestion of sugar, lack of dietetic balance), causes irritation and increased flow of mucus. The mouth is hyper-mucinated, resulting in increased susceptibility to accumulation of debris upon the teeth.

There may be accumulations (unclean mouth) without caries:

- (a) Saliva passes through freely and irrigates the surface of the tooth.
- (b) Potential alkalinity of saliva (inorganic element) sufficient to neutralize acid by-product (carbohydrate element) in static area.

Slide 21

### NORMAL SALIVA.

Free passage of normal saliva over teeth cleanses surfaces and prevents Dental disease.

WHEN SALIVA CEASES TO FLOW FREELY, IN ACTUAL CONTACT WITH THE SURFACES OF TEETH, FERMENTATION OCCURS PROVIDING CARBOHYDRATE PABULUM BE PRESENT.

Free flow of saliva prevented by:—

- (a) Capillary Pressure operating in suitable spaces. Capillary spaces may even occur about contact points where lateral movement has worn contact flat. (Colyer.)
- (b) Mucinous plaque. Saliva passes over film without touching surface of tooth.

Importance of Irrigation in Modern Surgery—  
Salivary Circulation (Irrigation) a Vital Factor  
in Immunity to Dental Disease.

Slide 22

### ANATOMICAL FACTOR.

Many teeth susceptible because of deviation from normal form or arrangement, or defect in enamel surface.

When teeth are anatomic, salivary flow passes over all surfaces, with beneficent result. Anatomical defects prevent free salivary flow over surfaces of the teeth just as effectively as mucinous film. Carbohydrate pabulum, dissolved in saliva, (and either of metabolic or alimentary origin), is held in contact with tooth surface by capillary pressure between surfaces of teeth and in deep fissures or pits where the force of capillary pressure operates.

Lodgment of food debris is due to faulty contact, lack of marginal ridges or mal-occlusion. Roughened surfaces, overhanging margins, may be cause. How frequently are fillings left in the mouth, with faulty contact and absence of anatomical form, simply because they cannot be dislodged with an explorer? ANATOMICAL RESTORATIONS VITAL-  
LY IMPORTANT.

## Slide 23

**MASTICATION.**

Household Science teachers, in preparation of table food, sometimes overlook the need of the teeth for adequate exercise.

The food should be of such a form as to require thorough mastication without injury to the teeth—fibrous rather than hard. Thoroughly insalivate all food, particularly starches, as the action of salivary ferment (ptyalin) is first step in the conversion of starches to sugar.

**Thorough mastication imperative:—**

- (a) Development of parts.
- (b) Exercise of jaws—proper blood supply to tooth and surrounding tissues.—Increased resistance to infection.
- (c) First step in digestion.
- (d) Excites abundant flow of saliva.
- (e) Cleansing of surfaces of teeth—  
Cleansing action of mastication clearly shown in cases of unilateral mastication.
- (f) Thorough mastication is check on over-ingestion.

F. C. Husband recommends as guide to patient,—  
chew pultaceous foods 20 times; bread 50 times; meat, corn, etc., 100 times. This constitutes

**MOUTH EFFICIENCY.**

## Slide 24

**GERMICIDES AND ARTIFICIAL CLEANSERS.****Germicides—**

- Interference with activity of tissues.
- Drug unknown that destroys micro-organism without injury to tissue cell.
- Presence of germs in mouth normal. Nature builds up immunizing factors in healthy tissue cell.

**Prophylaxis—**

Hopeless for dental operators and periodontists to confine treatment to removal of local product of disease, and give no concern to initial cause.

**Artificial Cleansers—**

More important as a toilet necessity than as prophylactic measure.

## Slide 25

**SUMMARY OF  
NATURE'S FORCES PREDISPOSING TO DENTAL  
HEALTH.**

- 1.—Anatomical—perfect masticatory apparatus—  
quality of tooth—form—and arrangement.
- 2.—Correct diet—(quantity—balance—mastication.)
- 3.—Good health and general immunity.
- 4.—Normal saliva, nature's mouth wash.
- 5.—Efficient mastication, nature's dentifrice.
- 6.—Movement of lips, cheeks and tongue upon  
mucous membrane and exposed surfaces of the  
teeth.



Slide 26

## CORRECT HABITS OF LIVING.

Some immune individuals do not use a tooth brush.  
Some susceptible people suffer caries in spite of constant artificial cleansing by most approved methods.

Surely nature has not bungled!

Correct habits of living bring immunity.

Reparative process is necessary, but that is only first step toward real treatment, which is

## PREVENTIVE DENTISTRY.

Slide 27

## CONCLUSIONS.

First.—Oral Bacteria not Determining Factor in Dental disease—present in both susceptible and immune cases—normal.

Second.—Presence of Carbohydrate an Essential Element in Caries.

Third.—Salivary stasis always present in dental caries.

Fourth.—Fermentation occurs in mouth when flow of saliva over free surface of tooth is interfered with:

(a) Anatomical defect, capillary pressure.

(b) Mucinous debris.

Fifth.—Anatomical consideration vital—make all Operative and Prosthetic Dental restorations true to anatomic form.

Sixth.—Indigestion, associated with increase of mucus, predisposing to accumulation of debris.

Seventh.—Excess of those foods which result in acid end-product in tissues, depreciates inherent quality of tooth, thus favoring susceptibility.

Eighth.—Dentists must practise as Dental Physicians, as well as Dental Surgeons.

Slide 28

## SUGGESTIONS FOR CLINICAL OBSERVATION.

Caries	}	Over-ingestion of sugar.
without Salivary Calculus		
Caries	}	Over-ingestion of Bread and Flour Products.
with Salivary Calculus		
Salivary Calculus	}	Over-ingestion of any Food.
Gingivitis	}	Over-ingestion
		Auto-intoxication, Trauma.
Thickened Saliva	}	Indigestion, — character of Diet or
Hypermucinated		lack of mastication

Slide 29

## ACKNOWLEDGMENT

In preparing manuscript in a subject such as this, it is impossible to mention all of the authors to whom one is indebted for suggestions, but the writer desires to express appreciation particularly to the following:—Pavlov, Pickerill, Sim Wallace, Kirk, Black, Howe, Sherman, Talbot, Bunting, Johnson, Head, Addis, Gies, Colyer, and McCollum.

—*Journal National Dental Association.*

### Third Stage Ether Anesthesia: a Sub-Classification Regarding the Significance of the Position and Movements of the Eyeball\*

ARTHUR E. GUEDEL, M.D., INDIANAPOLIS, INDIANA.

THIS paper with the accompanying scheme of illustrations was used by the writer many times in teaching anesthesia with the A. E. F. in France.

The objects in presenting this paper are two: *First*, to encourage lighter and more even ether anesthesia; and *second*, to present some tangible form for didactic teaching of anesthesia to students.

Our literature up to date mentions four stages of anesthesia. The first stage, during which the patient experiences analgesia but does not lose consciousness; second, the stage of excitement; third, the surgical stage, and fourth, the stage beginning with cessation of respiration and ending with cardiac paralysis and death.

#### DEMANDS OF MODERN ANESTHESIA.

Modern anesthesia requires more than this. The knowledge that the patient is in the third or surgical stage is not now sufficient. We should be able to say at any time in just what part of the third stage we are carrying anesthesia. The latitude of third stage anesthesia with ether is great, so great that the patient may easily be given more ether than necessary without being in any immediate danger. Postoperative toxemia is in direct proportion to the amount of ether administered. The patient may be carried lightly with good relaxation and quietude, and suffer but light postoperative toxemia from the ether, or he may be carried for an hour in the deepest part of the third stage with immediate safety so far as the anesthetic is concerned, but the postoperative toxemia will be great. Light anesthesia, if it be acceptable to the surgeon, is infinitely better than deep anesthesia. We

\*This is an Author's Abstract of a paper read before the Indianapolis Medical Society, the Indiana State Medical Association and the Interstate Association of Anesthetists, during the Sixth Annual Meeting. Bulletin No. 3 of the N.A.R.S.

have known this for a long time, but have not known that there is a very light stage of surgical anesthesia which affords the surgeon as much ease and comfort in operating as the state of deepest third stage anesthesia. We have often stumbled onto this stage,—one of quietude and tranquility, but were usually alarmed by the apparent respiratory depression, and by withdrawing all ether, have usually lost it.




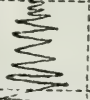
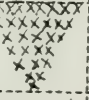


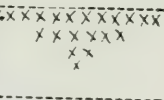














Many of the anesthetists, even of today, state that it is necessary to watch only the respiration of the patient in order to determine the degree of anesthesia present. However, our better anesthetists realize that they must take note of every available sign in their work if they are to do it well.

### VALUE OF EYEBALL AND PUPIL.

In my experience, which includes over 10,000 cases conducted personally and by my assistants in France, the eyeball with its position and movements has afforded a sign which, in proper classification, is reliable and cannot be ignored. The oscillation marks the stage of ideal anesthesia after the first ten or fifteen minutes of administration have elapsed.

I have divided the third stage ether anesthesia into four strata. The accompanying chart presents a correlation of the various signs

SCHEMATIC CHART SHOWING THE SIGNIFICANCE OF CERTAIN REFLEXES UNDER VARIOUS STAGES OF ETHER ANESTHESIA.

Stages of Anesthesia	Respiration Anesthesia going Down	Respiration going Up	Eyeball	Pupil Without Morphin	Pupil With	Larynx Up and Down Movement
First Stage						
Second Stage						
Third Stage	First Stratum 					
	Second Stratum 					
	Third Stratum 					
	Fourth Stratum 					
Fourth Stage						
Column	A	B	C	D	E	F

found in the different strata of the third stage. Attention is called in this paper only to the third stage, inasmuch as there is nothing new to be said of the first, second and fourth stages. The chart consists of columns A, B, C, D, E and F, and takes into consideration various signs separately and in conjunction with each other.

COLUMN A—SHOWING RESPIRATION WITH ANESTHESIA GOING DOWN.

There is no regularity or rhythm to the respiration of the second, or stage of excitement. From experience we recognize the transition from the second to the third stage, by the inauguration of respiration that is rhythmical and exaggerated. The exaggeration is marked and continues so, almost without change, provided there is a continuance of sufficient ether to carry the anesthesia progressively downward throughout the first, second and third strata of the third stage. However, as the fourth or deepest stratum of this stage is entered, the respiration shows beginning depression. This depression continues progressively downward through the fourth stratum until its complete cessation marks the transition into the fourth stage.

COLUMN B—RESPIRATION WITH ANESTHESIA COMING UP.

After respiration has ceased as the fourth stage is entered, the ether has been removed and respiration started by artificial means, it will begin as it left off, with shallow movements. As the patient unloads his excess of ether coming up, the respirations grow in depth progressively, the rhythm being maintained, until the upper border of the fourth stratum is reached. Here there is an exaggeration corresponding to that in column A at the same level. As the patient continues to come out, this exaggeration continues as in column A, throughout the third and second strata. As the lower border of the first or upper stratum is reached there occurs the beginning of a quieter respiration. Why respiration should become quiet at this point with anesthesia coming up, I do not know; but it does. It becomes progressively quieter as the first stratum is traversed upward, until at the upper border it apparently almost ceases. This is just before the patient comes out to the coughing or vomiting state. This respiratory state of quietude has often alarmed us and not infrequently has caused the surgeon to pause in his work to inquire the condition of the patient. True, to one who has not been watching closely the progress of the anesthesia, to one who judges the degree of anesthesia by the respiration alone, the finding suddenly of this quiet respiratory stage is apt to be alarming. Under the old rule of "When in doubt, wait" which by the way is always a good rule to follow, the ether would be removed and the patient soon found vomiting or becoming unquiet. However, there need be no doubt about the degree of anesthesia here. The question to be decided is a simple one. Is the patient just ready to come out, or to go out? In other words, is he in the first stratum



of the third stage, or in the fourth stratum? The answer to this lies in the eyeball.

#### COLUMN C—THE EYEBALL: ITS MOVEMENT OR ITS POSITION.

The eyeball offers one of the most important signs in anesthesia today. *As long as the eyeball is oscillating or is in an eccentric position though stationary, there is no danger that too much ether has been given. Aside from extraneous circumstances, such as positional asphyxia, hemorrhage, or shock, if the eyeball is moving or is stationary but eccentric, the patient is safe and in good condition.*

*As the patient enters the first or upper stratum of the third stage, either from above or below, there is manifest a partial paralysis of the motor oculi muscles. Either there will be an intermittent contraction or relaxation, or variations of these, causing a rhythmical oscillation of the eyeball, or there will be a stronger tonic contraction of one set than of another, resulting in a stationary but eccentric globe. Occasionally in the alcoholic, or the individual of high reflex nervous tension, in place of the above there will occur a peculiar slight twitch of the globe, usually in a lateral direction. This twitch may not occur until from three to five seconds after the lid has been raised for inspection, therefore this inspection should not be momentary. When this twitch does occur, whether late or early, it means the same thing as above, namely, that there is only a partial and not a complete paralysis of the motor oculi muscles.*

*Whether there is a rhythmical oscillation, an eccentric stationary globe, or the twitch just mentioned, the meaning is the same; the patient has not had too much anesthetic and, other things being equal, is in an ideal stage of surgical anesthesia.*

As seen in the accompanying chart, the motion or eccentricity of the eyeball is greatest at the extreme upper border of the first stratum of the third stage. As anesthesia progresses downward from here this motion or extreme position decreases progressively until the second stratum of the third stage is reached. The transition from the first to the second stratum is marked by the cessation of the eyeball movements, or by the change from *eccentric stationary* to *centric stationary* position of the globe. This is the point at which the paralysis of the motor oculi muscles becomes complete.

With anesthesia going down there is no further movement of the eyeball, no further contraction of any of the motor oculi muscles.

#### THE PROBLEM OF RAPID INDUCTION.

In hospital anesthesia as it is conducted today, with the hurry to have the patients ready for the waiting surgeon, they are forced under rapidly, either with straight ether or with the nitrous oxid, or ethyl chlorid, or some other ether sequence. They are usually taken to the knife before there has been time to "even them up," or before they have settled down to an even ether saturation. Consequently, at first,

there is a deeper degree of anesthesia necessary for quiet relaxation than that indicated by the partial paralysis of the motor oculi muscles. Here it is up to the anesthetist to put the patient, in the beginning, down to the second or even the third stratum, as herein illustrated, but to allow him to come up to the first stratum, that of the oscillating or eccentric eyeball, as soon as possible, *and to maintain him there.*

In this state the patient presents a better operative general condition than in the second or third stratum, because of the quiet respiration. As a rule it is as satisfactory to the surgeon as the fourth or deepest stratum.

In anesthesia with ether, carried for an hour or more, if the eyeball be *kept oscillating* the patient will usually emerge shortly from the anesthetic and there will be less nausea and depression than we have formerly experienced. By watching the eyeball reflex internes are now conducting better anesthesia than before.

If it were always possible to use as much time as one desired in the induction of ether anesthesia, the patient could, in the course of fifteen minutes or so, be carried gradually to this first stratum of the third stage and anesthesia be there maintained throughout the operation. But for some inexplicable reason, in most hospitals, the idea of saving time is to *start* the operation. Its finish may come when it will.

In finishing the consideration of column C of the accompanying chart, it is important to say that when the respiration is found very quiet and seemingly depressed to a considerable degree, *the eye must be inspected.* If the eyeball is oscillating or eccentric the stage of anesthesia is right and ether should be continued. If the eyeball is *stationary on center* with the pupil dilated, the anesthesia is too deep, and ether should be discontinued at once.

#### COLUMN D—PUPIL WITHOUT MORPHIN.

Morphin is so universally used as a preanesthetic narcotic, either alone or in combination with other drugs, that this column is of only relative importance. Before the advent of the use of morphin generally for this work we were taught that the pupil may be dilated, but that it must react to light. *Without morphin the pupil, in the average case, does not begin its dilation with the lower part of the second or upper part of the third stratum is reached. Therefore the dilated pupil, even without morphin, is an indication of anesthesia being too deep.*

#### COLUMN E—PUPIL WITH MORPHIN.

The statement has often been made that when morphin is given in combination with atropin in the usual proportions of 1-4 and 1-150 gr., the pupillary reflex will be the same as when no morphin is given. This is not true. With this combination the pupil will not as a rule dilate as early in anesthesia as when no morphin has been given.

*It is safe to assume that when morphin has been given, no matter*

*in what combination, a dilation of the pupil in the conduct of anesthesia is a manifestation of careless technic on the part of the anesthetist.*

NOTE: Columns D and E of this chart cannot be considered accurate for all cases. But though they may not be accurate, they are sufficient to show that in neither case is it necessary to have any dilation of the pupil in order to secure quiet and relaxed anesthesia.

*An apropos note is here in order. No anesthesia can be safely relaxed and quiet, no matter how much ether be given, if the respiratory passages be not kept freely open, or if the patient be sub-oxygenated. Where the respiratory passages cannot be kept constantly open, pure oxygen should be administered, whether through the ether or separately. Only thus in certain cases can the patient be relaxed.*

#### COLUMN F—THE LARYNX; ITS MOVEMENTS.

Although an ancient sign, this movement of the larynx is not to be ignored, especially in this classification. With the eyeball moving or eccentric the danger in conduct of the anesthesia is not that the patient may "Go out," but that he may "Come out." *There is usually at all times a rhythmical movement of the larynx up and down with the respiration. There is always the exaggerated movement of this organ up and down with swallowing. This is well manifest in the induction.*

This movement of the larynx in swallowing is of importance here in that it assists the anesthetist in guarding against vomiting during the operation. *With anesthesia coming up, at the extreme upper border of the first or upper stratum of the third stage, just before the patient comes out of the vomiting or second stage, there will occur, in the average case, an exaggerated up-and-down movement of the larynx, half a minute or so before vomiting takes place. If the little finger of the mask-holding hand be allowed to rest over the larynx, this exaggerated movement may be detected immediately it begins. There is yet time to increase the amount of ether gradually, and sufficiently to carry the patient back where he belongs without permitting retching or vomiting. I say gradually, because if at this stage a concentrated ether vapor be suddenly administered, there will usually follow laryngeal, or pharyngeal spasm, with coughing.*

#### THE REFLEXES UNDER OTHER ANESTHETICS.

Although this paper is intended primarily to cover the third stage of *ether anesthesia*, the significance of the eyeball in this classification is not limited to ether alone.

These signs hold good with any anesthetic agent now commonly in use, no matter what attention has been paid to preanesthetic narcotics. Morphin in any combination does not influence them. Neither does chloral or its allied drugs. *The eyeball signs are constant.*

#### NITROUS OXID-OXYGEN.

With this mixture alone, I have never been able to get a patient



anesthetized beyond the stratum of the oscillating or eccentric eyeball where the anesthesia was properly conducted. Proper nitrous oxid-oxygen anesthesia requires a pink or rose-colored patient. As long as this color is maintained it is quite out of the ordinary, if not impossible, to carry the anesthesia beyond the first stratum as herein illustrated. In *improper* anesthesia with this agent, the asphyxial element being allowed to enter, it is, of course, quite possible to so intoxicate the patient with carbon dioxid that there will occur a complete paralysis of the motor oculi muscles and a complete dilation of the pupil. This is inexcusable technic.

#### ETHYL CHLORID.

Properly handled, this agent is an excellent substitute for nitrous oxid and therefore deserves mention. There is much that is new in the way of observation of the action of this agent that cannot be considered here. Suffice it to say, that with ethyl chlorid, administered slowly, as long as there is maintained only a partial paralysis of the motor muscles of the eyeball, the anesthesia is entirely safe. Ethyl chlorid should not at any time be given beyond this point.

#### CONCLUSIONS.

1. This is a plea for lighter and better anesthesia.
2. It is a plea for better teaching of anesthesia in our medical schools and hospitals.
3. As long as we note any movement or eccentric position of the eyeball, aside from that which might be normal for the occasional patient, that patient has not had too much anesthetic; but after anesthesia has been well inaugurated, he has had quite enough.
4. The upper part of the third stage, namely, the first stratum, is anesthesia entirely as satisfactory to the surgeon as the second, third or fourth stratum of the third stage.

---

### Canadian Society of Anesthetists and the Dental Profession

---

THE Canadian Society of Anesthetists held its Annual Meeting at the time of the Ontario Medical Association at Niagara Falls during the last week of May.

The constitution of the Society provided that only licensed and qualified practitioners of Medicine shall be eligible for ordinary membership when such Licentiates include in their practice the administration of anesthetics. Licensed practitioners of Dentistry are permitted to become associate members, and are thus debarred from voting or holding office in the Society.

It has been expressed as the desire of the officers of the Canadian Society of Anesthetists that there should be co-operation between this



Society and the members of the Dental Profession. But the provision debarring Dentists from active participation in the affairs of the Society prevents the sympathetic and whole-hearted co-operation of members of the Dental Profession, which appears to be so desirable. Enquiry was made to ascertain the reason for the present regulations covering membership.

In answer to an inquiry, the Secretary states that the Society is very anxious to have associated with it the Dental Profession, but added:

"We found, however, that in some of the provinces it was only legally qualified physicians and surgeons who could administer anaesthetics in a legal manner in surgical cases, and as this is a Canadian Society of Anaesthetists and not provincial, we either had to confine it to the physicians and surgeons altogether or include the dental profession as associate members. We are very sorry that associate members have not the full privileges of the Society and therefore, are not eligible for office. Further, you will see by the constitution that nominations can only come from members of the Society. It is not our fault that the laws are such that we could not include your profession, with which we are so closely allied, to the full privileges of the Society. Our president agreed with me that views as set forth above, must be adhered to."

Upon further enquiry as to the name of the Province in which it was claimed to be illegal for a Dentist to administer an anaesthetic, the Secretary of the Canadian Association of Anaesthetists states:

"That in the organization of the Canadian Society of Anaesthetists, I personally took advice from a lawyer here (Montreal) and it was found that, at least in the Province of Quebec, the law is so written that his interpretation of it was that anaesthetics must be given by qualified and licensed practitioners of medicine and surgery only and that is why we decided to have our By-Laws as they are."

Upon receipt of this intimation, Dr. Eudore Dubeau, Dean of the Faculty of Dentistry, University of Montreal, was communicated with, and we publish herewith the reply of Mr. G. A. Marsan, K.C., Professor of Dental Jurisprudence at University of Montreal, which has been forwarded to ORAL HEALTH by Dr. Dubeau.

#### LAW OF QUEBEC—USE OF ANESTHETICS BY DENTISTS.

Is the practice of Anaesthesia forbidden to a dentist exercising his profession in the Province of Quebec?

The degree conferred by the Schools of Dental Surgery of the Province of Quebec is that of "Doctor of Dental Surgery" (D.D.S.)

In the program of examinations which precede the conferring of this degree there will be found everything susceptible of acquainting dentists with the intimate nature of anaesthetics, their toxic effects and the method of employment. Courses are also given the students in.

among other subjects, the following: auscultation, dissection, (whole body) anatomy and physiology. Consequently, the dentist, in case of accident, would benefit from the presumption of capacity which attaches to the diploma and he would be presumed to thoroughly understand the physiological effects, the method of administering the agent in all phases of the operation and the practical details for its use.

It may be opportune to recall here that Surgical Anaesthesia was discovered in 1844 by Horace Wells, an American dentist.

The limits of the profession go beyond all legal definitions, but one can say, however, that the dental art consists, essentially, outside of the prosthesis, to attend to affections of the teeth and ailments of the mouth connected therewith. A source of responsibility may emanate from the employment of anaesthetics. For instance, Cocaine is commonly employed in dental offices in order to produce anaesthesia, and its toxic effect calls for much attention; it is very dangerous and may cause death. In case of accident, the experts will have to determine and consider whether or not the dentist assured himself of the temperament of his client, of the dose used; if, in a word, he proceeded rationally and in conformity with the requirements of the science.

According to the federal Opium and Narcotic Drug Act, 10 & 11 George V., ch. 31 (1920), physicians and dentists, duly licensed, are authorized to prescribe cocaine and to use it in all medical treatments.

And the Quebec Law regulating the sale of cocaine, morphine and their compounds, 1 George V., 2nd. sess., ch. 35 (1911), S.R.Q. (1909), art. 3982a, 3982d and 3982f, says that duly licensed physicians and dentists are authorized to procure cocaine and to use it in the exercise of their profession.

The authority given to do a thing carries with it all the powers necessary for that purpose, C.C. art. 17, par. 16.

Furthermore, article 5082 of the Revised Statutes of Quebec (Dentists Law) 1909, enacts that:

"The privileges and exemptions conferred on physicians and surgeons by the laws of this Province are hereby granted to licensed dentists."

The word "privilege" is said of the faculty accorded to do a certain thing, or to enjoy some advantage which is not a common right. It is also used to describe certain rights and prerogatives attached to undertakings, employment, conditions, etc.

Qualified dental surgeons are therefore not responsible for accidents occurring through the employment of anaesthetics except in the case where the anaesthetic is administered contrary to the rules of the art.

From the foregoing, one can, therefore, conclude that in the Province of Quebec a licensed dentist can, without the assistance of a

physician, employ anaesthetics.—G. A. Marsan, K.C., *Professor of Dental Jurisprudence at University of Montreal.*

We hope that the Canadian Society of Anaesthetists will amend its Constitution so that practising Dentists who administer anaesthetics may be received into full membership in the Association, in order that all anesthetists, whether practitioners of Medicine or Dentistry, may in the interests of Science, have the advantage of association and exchange of ideas to their mutual benefit.

---

## Meeting of Board of Directors, Royal College of Dental Surgeons of Ontario

---

THE Board of Directors of The Royal College of Dental Surgeons held their regular meeting in Toronto, May 9th to 14th, 1921, the following members being present: Drs. S. S. Davidson, M. A. Morrison, R. G. McLean, R. H. Cowen, W. M. McGuire, E. E. Bruce, H. R. Abbott and A. D. A. Mason.

The examination results of both the undergraduates in Dentistry and Dental Nurses Course were considered, and the successful candidates were passed.

During the year \$111,477.77 was expended for building new Anatomical wing and equipment for Dental Infirmary and Laboratories. The Bank overdraft was shown by the Auditors' Report to be approximately \$65,000.00. It was reported to the Board that the Ontario Government had included in the estimates at the last session of Parliament the sum of \$13,029.00 for the purpose of reimbursing the College for the amount advanced to war veterans by way of deferred payment of fees.

The Board decided that next session 160 students should be received in the Pre-Dental and Freshman Years, and that of this number 60 places should be reserved for candidates outside of the Province of Ontario, thus avoiding disappointment on the part of candidates who come from a distance and who might otherwise find upon their arrival that the classes were already filled.

Tenders were received for the supply of dental instruments and outfits for students, and these were awarded. This provision will enable the College to see that each student is supplied with a complete set of instruments, and will obviate the necessity for the student to make numerous individual purchases. The President of the Students' Parliament acted for the student body and was present when the tenders were awarded.

The Dental Nurses Course will be limited to 25 members next session, and a preliminary educational requirement of two years High School training will be demanded. The Dental Nurses Course will commence on the first Tuesday of September, and all candidates will



be registered upon probation for the first 30 days, and will be permitted to proceed only upon the recommendation of the Supervisor of Nurses. The entire course will be given in the College Building, the fee being \$60.00 for complete course and \$40.00 for those who are permitted to enter following the Christmas vacation.

Dental Nurses are trained in all branches to act as an assistant to the Dentist, but the course does not include Prophylaxis. It is the judgment of the Board of Directors that with adequately trained Dental Nurses to assist practitioners, graduate Dentists will be able to render prophylactic service without delegating this important work to others.

The College Infirmary will open each year for a summer session during the months of May, June and September.

All students between the Junior and Senior Years will be required to either spend one month in the College Infirmary, or, in lieu of that, two months under indentureship with an approved Licentiate.

The Pre-Dental standard will be required of all students who commence the study of Dentistry Session 1921-22, and this regulation will apply to all such students who take their course at the R.C.D.S. or elsewhere, and who at graduation desire a license to practise Dentistry in the Province of Ontario.

A suitable tablet is to be erected on the walls of the College Building, upon which will be inscribed the names of the undergraduates and graduates of the College who made the supreme sacrifice in defence of their country.

Arrangements were completed for the Post-Graduate Course to be conducted by Professor W. E. Cummer upon Full and Partial Prosthesis during the month of September.

Provision was made for an oil painting of the late Professor W. T. Stuart to be hung upon the walls of the College, also photographs of the Past Presidents to hang in the Board Room.

The Discipline Committee reported certain action taken regarding Toronto and Hamilton practitioners. Other cases were reported as being still under advisement by the Committee at the present time.

A grant of \$400.00 was made to the Ontario Research Committee, which is acting this year as the Executive of the Canadian Dental Research Foundation.

It was decided to hold the R.C.D.S. Alumni Re-Union annually, and that next year the members of the Canadian Dental Association be invited to a complimentary supper as guests of the Royal College of Dental Surgeons during the meeting of the combined Ontario and Canadian Dental Associations in 1922.

The resignations of Drs. A. A. Stewart and W. H. Coon were accepted by the Board, who placed on record its hearty appreciation of the valuable services rendered by these men during their years of association with the College.



## Dental Nurses Graduate

THE Dental Nurses' Course, Royal College of Dental Surgeons, was brought to a successful closing on the evening of May 12th, 1921, when the Dental Nurses were awarded a Gold Pin and Diploma by Dr. M. A. Morrison, the President of the Board of Directors, on behalf of the R.C.D.S.

The closing exercises were held in the Assembly Room of the College, after which the Nurses entertained their friends at an informal dance.

The following candidates graduated as Dental Nurses:

Adams, Marjorie Ethel.	Graham, Ella May.	Robb, Dorothy E.
Allen, Leona Maud.	Hamilton, Janet.	Rose, Agnes Helen.
Amyot, Sophie G.	Ingram, Agnes Muriel.	Sharpe, Edna Mary.
Arnett, Doris M.	Lapp, Reta Luella	Sherwood, Edith.
Bennett, Ola Elizabeth.	Love, Helen Marjorie.	Stewart, L. Thelma.
Black, Margaret Isabel.	McEnaney, Dorothy.	Waddell, Christina C.
Davidson, Violet D.	Mackle, Evelyn.	Wansbrough, Ullah M. A.
Dumouchelle, Florine.	Martin, Jean.	Wesley, Athol Marie.
Dynes, Ruby Irene.	Mitchell, Helen.	Willis, Olive E.
Goodchild, Grace E.	Murphy, Kaye Gertrude.	Young, Annie B.
	O'Gorman, Norah	

## Graduates in Faculty of Dentistry, Dalhousie

AT the Annual Convocation of Dalhousie University, May 5, 1921, the following graduates of the Faculty of Dentistry received the Degree of Doctor of Dental Surgery:—

Bagnall, John Stanley.....	Prince Edward Isl.
Crowe, Victor Densmore....	Nova Scotia.
Finigan, Malcolm Daley.....	Nova Scotia.
Lawley, James Herman.....	Nova Scotia.
Lent, Frederick Eugene.....	Nova Scotia.
MacIntosh, George Peter.....	Nova Scotia.

## Royal College of Dental Surgeons and Dental Department, University of Toronto

### DENTAL GRADUATES, 1921.

THE successful members of the Senior Class of the Royal College of Dental Surgeons graduated on the 13th of May, 1921.

Commencement exercises were held in Convocation Hall, University of Toronto, at 8 o'clock, when Dr. C. N. Johnson, Chicago, and the Honourable Mr. Justice Riddell, LL.D., addressed the graduates.

The Honorary Title of Master of Dental Surgery was conferred upon Dr. C. N. Johnson, Dr. H. R. Abbott and Dr. A. E. Webster

by the Board of Directors of the R.C.D.S. The Degree of Doctor of Dental Surgery was conferred upon the Dental Graduates by Sir Robert Falconer, K.C.M.G., LL.D., acting for the University of Toronto.

The following are the graduates:

Abar, Harry Smith	Foster, Bruce David.	Martin, Lawrence Mel.
Adams, Harold	Gabriel, John Matthew.	Millen, Gordon James.
Adams, Russel Bertram	Garfat, Earl.	Mills, Raymond Judd.
Agnew, Robert Gordon	Garvey, Leo, Richard.	Mitchell, William.
Akins, Sam'l Clements	Gott, Adlington.	Moulson, Harry.
Anderson, Herbert R.	Graham, Foster M.	Murta, Frank O. H.
Armstrong, William J.	Granovsky, Tevia Leib.	Murphy, Alexander Ed.
Asselstine, Curtis W.	Haines, Clifford Albert.	Olson, Johannes O.
Barber, Ida Miriam.	Halladay, Guy Burton.	Paul, Gordon S.
Barnes, Adolphus Fred.	Harper, Howard.	Porter, Alvin Beverley.
Barnes, Leslie Vernon.	Hilliker, Arthur E.	Pratt, Mack Lancelot.
Barton, Aubrey J. T.	Hoar, Howard Blair.	Provost, Thomas A.
Bateman, Harry R.	Howson, Geo. Wm.	Robb, William James.
Bayne, Hugh Cameron.	Hunter, William Harold.	Roberts, Joseph Floyd.
Beattie, Newell.	Hyde, Russell George.	Robinson, Thomas A.
Beckett, Russell James.	Irwin, James Erle.	Rochon, Rene.
Bertrand, Ozro Herman.	Jewitt, Geo. Gladstone.	Rodwell, William John.
Best, James Harold.	Johnston, Grant.	Rogers, John Lea.
Bradley, Alva Ogle	Johnston, Robt. Edison.	Rowsome, Clarence McC.
Broadworth, Robert T.	Jones, Unsworth N.	Sheridan, William E.
Buckr, John Arthur.	Kennedy, Joseph A.	Smart, Clarence Cecil.
Calbeck, Geo. Arnim.	Kerr, Arnold Roy.	Snell, George Hillman.
Cameron, Alvin Alex.	Killoran, Martin Edwin.	Socket, Richard James.
Campbell, Ellsworth T.	King, John Amassa.	Spellman, Jos. Alexis.
Charavel, Edmond G.	Kinsman, Margaret A.	Steele, Charles W.
Clark, Wilfrid Daniel.	Laidley, Clifford H. M.	Stewart, Chas. Graham.
Code, Hilliard McCauley.	Layton, Norman MacG.	Stewart, Gilbert O.
Corbett, Fred Minto.	Legate, Harry Burton.	Thompson, Fred Lionel.
Coughlin, Leo Michael.	Letellier, Leon A.	Taylor, Cecil Joseph.
Coyne, John Thomas.	Lewis, Terrell Doswell.	Teal, Glenn Evelyn.
Dales, Aldrich Flatt.	Lumb, Robert John C.	Thornley, Glen Arthur.
Daly, Arthur Patrick.	McAllister, M. R.	Upton, Eber Rowles.
Davidson, Benjamin.	McCool, Leonard Hugh.	Wagner, George Wm.
Derbyshire, Aubrey O.	McCutcheon, Robt. C.	Warnica, John Fred.
Dinniwel, Richard E.	McFeetors, Henry E.	Wessels, Wyman E.
Dixon, Elliott Rupert.	McGowan, James C.	Whittaker, Robert R.
Dobbs, Eric Raymond.	McIntosh, Duncan D.	Whyte, Jas. Patterson.
Dodds, Lee Ralph.	Mackay, Alex. Walter.	Wilkey, Wilbert John.
Duff, John Carl.	McKee, Godfrey Gilford.	Wilson, Chas. Beresford.
Dunbar, Ira William.	McLeod, John Murray.	Wilson, Percy R.
Elliot, Cyril Augustus.	McLister James Carl.	Windrim, Harold L.
Elliott, Everett Victor.	Marshall, Earl.	Woods, Russell Gilbert.
Faulkner, Wilbur Jos.	Marshall, Thomas Robt.	Zimmerman, James.

COATING FOR SILICATE FILLINGS.—Thin solution of flexible colloid, sandrac, resin, banana oil (amyl acetate) or lacquer may be used successfully. Each may be thinned with ether. A very thin solution of celluloid in acetone may be used too. Any one of these varnishes is good, and any one may be used for cavity linings, as well. Cocoa butter or any similar product, whose melting point is not higher than body temperature, is also very good.—*H. E. Tompkins (Dental Summary).*

# Infections About the Teeth in Relation to Systemic Disease\*

CHARLES H. HENSEL, M.D.

I AM glad indeed to have this opportunity to address you, for during the past few years I have developed some rather positive ideas on this subject, the chief of which are:

First, that our knowledge is quite limited:

Second, that it is a problem requiring close co-operation between both the dental and medical professions, and

Finally, that the present wave of ruthless extraction of teeth must be checked and teeth extracted not on general principles, but only when proven to be a cause of the disease.

When Billings put forth his "Theory of Focal Infection" a little over half a decade ago, it rapidly met with popular favor, and a wave of enthusiasm for hunting hidden foci soon seized the medical profession.

But it took time and painstaking investigative work to examine the entire body for foci of infection, and as the mouth was easily and quickly viewed, and it wasn't much of a trick to jerk out a tooth under gas or novocaine, and as a few brilliant results followed some of these extractions, the teeth soon became the chief point of attack for every kind of disease from the "pipp" to housemaid's knee.

It soon got to the point where a physician or dentist was considered derelict in his duty if he didn't examine and advise extensive extraction.

This wave of radicalism was helped along by two things: First, the reports in 1915 by Bass and Johns of Tulane University of the findings of the *Endameba Buccallis* in the mouths and about the teeth of patients affected with pyorrhea—which parasite they confidently believed was the causative agent of pyorrhea.

Barrett and Smith, working independently in the same year, came to the same conclusions, which they published in *Dental Cosmos*.

These findings stimulated a great amount of research into the bacteriology of mouth organisms.

Second, the perfection and simplification of the X-ray making it adaptable to the dentists' needs, enabled the dentist to study the hidden areas of the jaws, just as the surgeon could study the rest of the body.

Finding of rarefied areas about the tips of devitalized teeth in the dental films and the recovery frequently bacteriologically of

\*Read before the St. Paul District Dental Society Special Study Section, February 28, 1921.



streptococci from these apical granulomata opened up a new field for speculation and a new hope for treatment.

When any problem receives intensive study a few valuable facts are discovered, but many faulty deductions, the result of enthusiasm and immature thinking, are also given forth so that it takes time and careful sifting to separate the gold from the dross, and we are in that stage today where we are doing this sifting, carefully retaining proven facts of value to augment our armamentarium in our fight against disease.

What then, are the proven facts that we may accept today?

If you will permit me, I will try to outline the situation as I see it. The theory of "Focal Infection" is a sound fundamental concept and here to stay.

It takes cognizance of primary and secondary foci—primary foci being usually in relation with mucous or cutaneous surfaces, while secondary foci are usually more remote and infection may be carried to these secondary foci by the blood streams, or through the lymph channels.

Foci of infection may be located anywhere in the body, the chief source being in the head where we have to consider the tonsils, teeth, accessory nasal sinuses, and the mastoid cells.

In the rest of the body foci may be found in the lung (i. e., chronic bronchitis and bronchiectasis) in the gastro-intestinal tract (i. e., septic gall-bladder-appendix-ulcers in the bowel and infected retro peritoneal glands); in the genito urinary tract (i. e., pyelitis-pyelocystitis-prostatitis and inflammation of the seminal vesicles), and possibly in the female reproductive tract, and also in infections about the hands and feet, such as ingrowing toenails.

I mention this list to show how multiple the sources of infection may be and how remote from the head. In the head the tonsils and teeth undoubtedly are the chief offenders, but in the majority of instances *the tonsils are the primary portal of entry for bacterial infection and the teeth are affected secondarily*, the infection being carried by the blood stream from the tonsils to the teeth.

I cannot emphasize this fact too strongly, for proper understanding of this will enable us to deal thoroughly and completely with systemic disease arising from foci in the head.

Often times when the patient reaches the dentist or physician, *both* tonsils and teeth are harboring foci and both foci must be cleaned up if we are to expect a cure. Furthermore, as a general principle we must remember that secondary foci are often produced by the tiny emboli of bacteria carried by the blood stream which start to grow and multiply in their new location and may produce a secondary depot of distribution, perhaps as active as the primary focus and which may persist after the primary focus has been eradicated.

This is what so frequently happens in that troublesome and painful condition, rheumatism, or more technically, arthritis—the joint sur-



faces and more particularly the periarticular tissues—the ligamentous attachments, etc.—become secondary depots of infection from septic emboli and the longer the duration of the disease the less likely are we to obtain results from the removal of the original focus.

In acute rheumatic fever occurring in childhood and adolescence up to about twenty years of age, in a majority of cases the tonsils, adenoids and sinuses are the foci of infection.

As we approach middle age (due doubtless to the gradual increase of pyorrhea and dead teeth) the teeth assume a more prominent place as factors in focal etiology, and fewer cases are traceable to the tonsils and sinuses, though it must not be forgotten that the tonsils may have been the original source of infection.

Arthritis deformans is apparently usually due to infection about the teeth.

In hypertrophic osteo arthritis we get thickening and swelling about the joints. We often find this condition associated with infection about the teeth, though imperfect metabolism and absorption of toxic products is supposed to be the cause.

What are we to expect then in rheumatism from correcting infection about the teeth?

In youth and up to age of twenty the tonsils are the chief source, in middle life and old age the teeth may have been the original source, but secondary deposits about the joints may keep up the trouble. Removal of foci in the head in these cases (periapical-pyorrhea-septic tonsils and infected paranasal sinuses) may serve to stop additional joint destruction, but cannot cure the joint deformity and restore destroyed joint surfaces.

Dr. Chatterton tells me that in over a hundred cases of chronic deforming arthritis he has only seen one case where the removal of infected teeth helped and this was in a recent case.

It is like locking the barn door after the horse is stolen.

The problem as we face it to-day is an endeavor to prevent these joint conditions by removing septic tonsils before rheumatism starts and eradicating periodontal infection at the same time.

I do not wish to be misunderstood and have you think that I do not believe in extracting abscessed teeth in rheumatism. I am advising the extraction of diseased teeth constantly in my study of general bodily disease; but I always try to be sure that the teeth are one source of trouble and that something will be accomplished by their removal.

Here is one case in point. A doctor in his early 30's had been running temperature for six weeks, had night sweats, felt weak and hardly able to drag around, and his joints and muscles were lame and sore. His tonsils were very suspicious looking and he had two devitalized teeth showing rarefied areas, with the history of a similar though

milder general condition five years previously, relieved by extracting one abscessed tooth.

I advised the removal of these two diseased teeth first and his general infection promptly cleared up.

He has had no trouble now for over six months. Is he cured? One cannot say. He still has his tonsils and he may get another attack of rheumatic fever five years hence. It takes time for us to decide these problems.

Another factor that makes it probable that this patient's tonsils are the primary source of infection is that while the removal of the first tooth caused the rheumatic symptoms to clear up, they returned again, when additional teeth were devitalized, showing that there was some septic source ready to focalize at any point of lowered tissue resistance such as occurs when the tissues about the tip of the tooth are traumatized in the process of devitalization.

As I said before, it does not seem reasonable that the dentists introduce all the streptococci found in apical granulomata.

#### DISEASE OF THE CIRCULATORY SYSTEM.

When we come to diseases of the circulatory system we have much the same problem as arises in diseases of the locomotor system.

In youth acute infective endocarditis is practically always due to infection arising in the tonsils, adenoids or paranasal sinuses.

We have likewise, the cardiac involvements following juvenile rheumatism, which have a similar source.

In middle and later life, sub-acute infective endocarditis is usually due to the streptococcus viridans. This form of infection is very deadly, causing death in practically every case. The organisms must get into the blood stream and their usual portal of entry is through the tonsils or the teeth.

Streptococcus viridans has occasionally been demonstrated in periapical granulomata in these cases of viridans endocarditis and seemed to be the source of the infection; *but mark this well*, not all cases showing the streptococcus viridans in periapical granulomata develop endocarditis. We know this must be true, for this organism is obtainable in pure culture from apical granulomata in the mouths of patients who never develop endocarditis.

This brings up another factor in our study, namely, resistance, natural and acquired, to infection.

This factor of resistance, or immunity, to infection, is a broad field of which we know really very little.

We are born into this world with a sterile gastrointestinal tract, but within 24 hours this tract becomes infected with bacteria-colon bacilli which stay with us peacefully all our lives and only occasionally stir up trouble.

Our mouths are swarming with bacteria often showing pneumon-

cocci and diphtheria bacilli on culture without our being sick. Ordinarily our resistance is sufficient to take care of these germs and keep them in subjection, but let something interfere with this nicely balanced relation and either the virulence of the organism increases or the resistance of the individual is temporarily lowered, due to accumulation of fatigue toxins, or to food toxins, from over eating and imperfect digestion and elimination, or from lack of exercise, or from other factors of which we know nothing, and we become sick—we succumb temporarily or permanently to bacterial infection.

If we survive, it is because our resistance rises superior to this bacterial invasion.

Now this matter of being sick is a peculiar thing. Some people are always sick—others seem never to be sick.

It is apparently a matter of constitutional vigor, and we are beginning to believe that the ductless gland system may have something to do with this.

How does all this talk about immunity apply to oral sepsis? In just this way:

The mere finding of streptococci viridans in periapical granulomata does not mean that the individual who possesses these organisms about his teeth has a viridans endocarditis, or will ever develop it. He may be perfectly well, because his resistance is up. He may be constantly vaccinated by slow absorption from these infected areas and thus his resistance is kept up.

The mere finding of rarefied areas about the teeth in dental X-ray films does not necessarily mean that these areas are causing the trouble for which the patient consults you. *They may* be the causative factors. If they are, then by all means remove them, but this is often hard to determine.

There is no more difficult problem today. I see too many patients who have had teeth showing periapical granulomata removed and are no better, not to feel that extraction is far from a cure-all.

Most of us show X-ray evidence of a tuberculosis in our lungs, yet comparatively few ever develop that disease,—pulmonary tuberculosis.

We must not forget the natural resisting forces of the body.

Some of you, in your enthusiasm may say, well, look at the brilliant results we are getting!

This may seem to be so, but follow these cases for a number of years and are you still as enthusiastic? Some of these same types of patients were equally enthusiastic about the curative effects of an appendectomy for relief of abdominal pain, but after a few months are back at their surgeon's office, or in another surgeon's office with that same pain still present.

But let us get back to the specific problems.

## ANAEMIA.

Anaemia means an impoverished state of the blood from whatever cause. It may be due to a decreased blood production, to increased blood destruction, to hemorrhage (i. e., uterine or post operative) and to acute or chronic infection as in oral sepsis from septic tonsils and infections about the teeth.

Whether the teeth alone are responsible for anaemia, it is hard to state. But it is certain we often find them diseased in conditions of anaemia. I have never seen a case of pernicious anaemia cured by the removal of oral sepsis, but I can bear witness to the fact that remissions appear to be more easily obtained and relapses longer delayed when the mouth infection is eradicated.

## DISEASES OF THE DIGESTIVE SYSTEM.

Sometimes patients with extensive pyorrhea or periapical granulomata or both conditions simultaneously, present themselves for examination with a history of indefinite stomach trouble and various laboratory findings.

These cases are occasionally markedly benefited by oral hygiene. What effect the regulation of kind and quantity of the food, regularity of eating and other general hygienic measures have on these cases it is hard to say, but these other connections must not be omitted and credit alone given to oral hygiene.

It has been claimed that gastric and duodenal ulcers may be a sequel to infection about the teeth. But these claims have not been substantiated and when there are many possible sources we cannot surely place the blame on the teeth alone.

## DISEASES OF THE GENITO URINARY SYSTEM.

In this portion of the body we have nephritis as the commonest lesion and while the teeth may be a causative factor the tonsils are a much more frequent portal of entry. In pyelitis and pyelocystitis on the other hand we occasionally have peridental infection as the causative agent.

## SUMMARY.

I have tried to cover in a sketchy way the chief points in this very broad subject.

If I have given you the impression that I am a stand-patter on oral hygiene that is not the thought I wish to leave with you.

I believe thoroughly that evil consequences may follow oral sepsis, but as yet we have not any definite way of telling whether the X-ray changes shown on the films are *the* causes of the systemic condition without pulling the teeth to prove it. Therefore we must develop our diagnostic skill to a greater degree in studying mouth infections.

Even after we have cleaned up oral infection, we cannot restore



deformed joints, straighten crippled heart valves or renew degenerated heart muscle fibres. We have been working chiefly at the wrong end of the problem.

Dentistry of the future must strive as far as possible to prevent oral sepsis; meanwhile in dealing with sepsis already existent, both physician and dentist must choose a middle ground half way between ultraconservatism and ultraradicalism.—*Xi Psi Phi Quarterly*.

### Alberta Dental Convention

THE Alberta Dental Association meets this summer in Edmonton, on July 20th-23rd. As four of the best men on the continent have been engaged for this meeting, it promises to be one of the best held.

Clinicians and Essayists are as follows:

Dr. Webster (Toronto).

Dr. E. Smith (Chicago)—(Surgery and Anaesthesia).

Dr. I. L. Furnas (Cleveland)—(Full Dentures).

Dr. T. W. Maves (Minneapolis)—(Inlays).

These men make an ideal combination and anyone who can take this in will be gladly welcomed by the Alberta Dental Association, and can be assured of being well repaid for the trip.

### Ontario Dental Association

THE Ontario Dental Association held a most successful convention this year at Toronto during the first week in May, with upwards of five hundred members in attendance. The programme was composed largely of Progressive clinics. Two noon day lunches were held when leading citizens addressed the convention.

It was decided next year to hold a combined convention with the Canadian Dental Association, which meets in Toronto during 1922. The following officers were elected for the ensuing year:

Honorary President, Dr. J. A. Fleming, Prescott.

President, Dr. Percy Moore, Hamilton.

Vice-President, Dr. R. J. Sprott, Barrie.

Secretary-Treasurer, Dr. J. A. Bothwell, Toronto.

Archivist, Dr. C. A. Kennedy, Toronto.

Board of Governors—Drs. Conboy, Plaxton, Gausby, Chalmers, Rutherford and Brooks.

Advisory Committee—Dr. R. G. McLaughlin, Seccombe, Clark, Paul, and Mason.

Oral Hygiene Committee—Drs. Eaton, Husband, Conboy, and Ellis.

# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## FRESH LIGHT ON PYORRHOEA ALVEOLARIS.

D R. HEINEMANN, of Elberfeld, found, upon a congenital left lower incisor, with fully-formed crown and the beginnings of root formation, a considerable deposit of yellowish-white tartar. The pressure of the tooth had produced an abscess on the upper part of the alveolus, and the adjacent mucous membrane had suffered inflammatory modification. He removed from the ductus submaxillaris a stone measuring 12 by 4 mm. It was at first soft and yellowish-white, but after twenty-four hours exposure to the air became quite hard and darker in tone. Since the buccal cavity is sterile before birth, and a loss of  $\text{Ca}$  is out of the question, it is evident that the formation of tartar is due to other causes than those which have so far been generally accepted. The analogy with other pathological processes which exhibit the calcination of primarily degenerate or necrotic tissue, leads Dr. Heinemann to the conclusion that a degeneration of tissue lies at the root of the formation of tartar. He is of the opinion that this process cannot occur as long as the mucous membrane of the mouth remains normal. But if, as a result of catarrhal conditions, there is an enhanced epithelial desquamation, then the necrotic cells will draw from the necks of the teeth, especially at the deepest point of the buccal cavity, the forward part of the lower jaw. And the necrotic cells form a centre of attraction for limesalts, as is also the case in the bladder and in the gall-bladder. In the occurrence of the intra-uterine formation of tartar, there will also be a morbid modification of tissue, as we have seen. And that is enough to account for the formation of the stone.—*Reported in The Dental Record from Österreichische Zeitschrift für Stomatologie.*

## METHOD OF GOLD CROWNING.

TAKING a molar crown as a sample: Prepare the root in the usual way, cutting it down of course, until it is below the free margin of the gum. If it is a bicuspid crown, take advantage of any resistance to the lateral stress which you can obtain by making

a bevel on the root, cutting the buccal and lingual lower than the centre, making an apex about the place where the root canal is. For molars, having shaped the root as above, the next step is to square out the pulp chamber for retention, and make it so that an inlay can be withdrawn. Enlarge the lingual root or the distal and fit a post. Fill the pulp chamber with wax, withdraw the post in position, and cast it. The next thing is to put the casting back into the tooth and take an impression in modelling compound, from which you get a model either in cement or amalgam. You then have a reproduction of that tooth with the pulp chamber filled in with an inlay, and a post going through the inlay down to the root canal. This serves as retention for the crown. Round the inlay, using the amalgam model, make a pure gold coping of about 34 gauge, and have it an exact fit. Tack it with solder very tightly to the inlay, being careful that no solder flows over the gold and so stiffens it. Put the piece back into the tooth and conform the coping to the margins with a foot plugger.

An impression is then taken and mounted on an articulator. For bicuspid, take an impression with the post in place in root canal, and having made an amalgam or cement model—it is necessary to wax the post and coping to protect them from the mercury of the amalgam and facilitate their withdrawal—make the coping and tack it to the post. Then proceed as for a molar.

It is as easy now to put on a porcelain as a gold crown. If gold is to be used, carve a tooth in wax. Saw it in halves and hollow it. Cast pieces separately, the lower half being cast directly on the pin and coping. Solder the top on and finish. If the bite is very close, it may be better to cast the crown solid.—*Dr. Norman W. White (Commonwealth Dental Review)*.

---

## National Dental Association, Milwaukee, August, 1921

---

THE 1921 meeting of the N.D.A. promises to eclipse any previous meeting of the Association. Convention facilities at Milwaukee are ideal for a national gathering, and ample provision is being made for all clinics and section meetings, that one group may not in any way interfere with another.

The Preventive Progress Clinic Club of the R.C.D.S. will put on some work. The members of the Club are arranging for a special car from Toronto to Milwaukee and return, and Dentists from Toronto and vicinity are invited to join the party. Those interested kindly telephone Dr. W. G. Trelford, Toronto, Secretary, Preventive Clinic Club.



## Chicago to California and Return

(Continued from May Number.)

AFTER a most glorious time in California, I took the Overland Limited one day at San Francisco, to go to Salt Lake City, Utah. We rode up through the fertile foothills, and over the mountains, and on down toward the Great Salt Lake of which every one has heard. As we approached this lake I noticed the passengers peering out the car windows and talking about "the bridge." The significance of the thing began to dawn on me as we approached the lake, and I saw a railroad bridge as far as the eye could reach. When the train began running on it I thought we would never reach the end. Mile after mile the train skimmed along near the surface of the water till I began to think there was nothing but bridge between the foothills and Chicago. When we finally got across and I made enquiry regarding the actual length of the bridge, I learned from authentic sources that it was 47 miles long. Imagine a bridge running east from Toronto down to Bowmanville, or west past Hamilton. The thing staggers one, and yet it is there for the eye to see.

Formerly the road ran around to the north of Salt Lake, but this made a detour which consumed more time than the energetic railroad authorities could spare, and so the bridge was built. I am reminded of a remark the late Dr. G. V. Black made to me on one occasion when we were looking at the splendid structure that had been erected in the city of St. Paul. Said he, gazing at it in admiration "*Man is a wonderful animal.*" And one has only to look at some of the things he has made to be impressed with this fact.

Soon after we crossed the bridge we came to Ogden—a thriving, brisk and progressive city. From this down to Salt Lake City we passed through a beautiful valley—fair and fertile, where I am told they raise, among other things, the finest celery in the world. I believe anything those Utah people tell me, because I have always found it to be the truth.



This was my first visit to Salt Lake City, and I had looked forward to it for years. I had heard so much about the place that I was more anxious to see it than any other city on the continent. It is a wonderful city, laid out by a master mind, with great broad streets, and with a foresight into the future that none but a genius could have possessed. Of course, everyone knows that the founders of this city were the Mormons, led by that intrepid spirit, Brigham Young. I had been brought up to abhor the name of Brigham Young, and all that Mormonism represented. As a boy I was fed on books dealing with the abomination of this particular creed, and especially of the horrors of polygamy, which was one of its chief tenets. No one to-day would sanely argue in favor of polygamy, and so my mind is just where it was as a boy, so far as this one practice is concerned. But aside from this, I have undergone a complete revision of sentiment regarding the Mormons. I have chanced to come in close contact with quite a number of them, and they have as a class compelled my respect, and even my admiration. I do not know to-day just what their religious beliefs consist in, but I know something of their mode of life and of their material achievements; and I am forced to acknowledge that in these respects they have set an example to the world that would be well worth following by the rest of humanity.

Think what they have been able to accomplish in that one community which, when they came to it in 1847, was a barren wilderness. Some of the buildings and institutions of Salt Lake City would be a revelation to those who are not familiar with them. Take the Tabernacle—everyone has heard of it—a building unique of its kind in existence. It is one of the largest structures for religious worship in the world. It is 150 by 250 feet and 80 feet high. There is not a column or pillar to deflect the sound passing from one end to the other. The arches of the roof rest upon 44 stone piers, and have no centre support. It will seat 8,000 people, and the acoustics are so perfect that it is said a pin dropped in one end of the building when it is empty may be heard at the other end. It contains one of the finest pipe organs ever made, and a picture I saw of the choir numbered nearly 300 persons.

The Temple, standing in the same block as the Tabernacle, is a magnificent structure, built chiefly of huge granite blocks hauled from the mountains. It is rich in the extreme, and required forty years to build, having been completed in 1893. I have never seen anything like it in the way of a building on this continent.

But these religious structures are not the only ones to claim attention in Salt Lake City. The State Capitol is located here on a rise of ground which slopes beautifully down toward the city. I was amazed at the magnificence of this building. It is one of the finest State Capitols in the country. It is 404 by 156 feet. Its

general style is pure Corinthian. The diameter of the dome is 64 feet. Fifty-two granite columns, 42 feet high, grace the exterior. I had the pleasure of visiting the Governor's Reception Room, and it is one of the most sumptuously furnished rooms I ever set foot in. The rug was 22 x 48 feet, and weighed 1,350 pounds. It was made in Scotland at a cost of \$3,500—in these days it would have been easily three times as much. The curtains were made in Florence, Italy, at \$250 per pair. The draperies in each window cost \$2,250. The chandeliers were made of Utah silver and gold at a cost of \$7,300. The furniture was of Circassian walnut, and the table alone cost \$1,750, while the table cover cost \$400. The mural painting was by Paul Chettle, and cost \$5,000. Altogether the room cost \$65,000, and it looks it.

As an index of the solidarity of Mormon methods may be mentioned an institution—commercial in character—which has stood the stress of all kinds of business depression, panics, wars, and other disturbing influences. "Zion's Co-operative Mercantile Institution" is the name of an organization founded many years ago by the Mormons—Brigham Young being the leading spirit, so I am told—which stands out conspicuously as among the most prominent and permanent of business successes. It is quiet and conservative in its methods, and enjoys the reputation of being as solid as the Rock of Ages. It is a demonstration of what may be accomplished in material achievement by community sentiment, breadth of vision, sound business policy, and the application of the cardinal virtues of integrity and common sense.

No people can be ignored in the great civic family who have done what the Mormons have, and when the time shall come that the blot of polygamy is wiped from the memory of man, these people shall come into their own as typifying the highest and best there is in ethical living and good citizenship.

As I have said, I have known many of them—some quite intimately—and wherever I have known them well, they have commanded my respect, my confidence and my friendship. About many things I may not believe as they do, but I accord to every man the right to believe as he wishes, provided his belief works no injustice upon his fellowman.

*C. A. Johnson*

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, JUNE, 1921

No. 6

## EDITORIAL

### Your Summer Holidays

THE real live, up-to-date Dentist of to-day leads a strenuous life. The very nature of his calling means a heavy demand on his physical and mental make-up, and if he is to continue to give his best services to his patients, he must needs have frequent and lengthened periods of relaxation. Everything needs to relax, if it is to work efficiently and endure. India rubber must not be kept continually on the stretch; the violin string should not be kept at the point of tension; and every piece of machinery should be given periods of rest to enable the molecules to come back to the normal. So it is with man. If he would keep in proper trim, he must have intervals of relaxation by means of holidays and interests.

As these lines reach our readers, the season for recuperation will be upon us. Let us be wise and listen to the call of the wilds, to come with our tired bodies and our holiday outfit, saying to the silent forests:

"Ope' your door and take me in,

Spirit of the wood.

Wash me clean from dust and din,

In thy restful mood."

We Canadian citizens are marvelously blessed in our playground possessions. In the choice of mountain, lake or stream, we can surely find a beauty spot to our liking,—a corner where we may hide our

tired bodies for a few weeks and forget the stress and strain of the year that has gone.

ORAL HEALTH would say, in all earnestness, to every brother Dentist, that if at all possible he should get away from the office and office cares for even a short two weeks. Bury yourself in that brief time somewhere in God's great out-of-doors. Breathe deeply the unpolluted air of lake and woodland, and, with rest and play and sleep, gird yourself for the battle of work looming in the year beyond.

Be advised, dear reader,—TAKE A HOLIDAY.

## Preventive Dentistry

THE importance of Dental Service is shown by the words of Dr. Mayo, the noted American surgeon, who said: "The next forward step in Preventive Medicine must come from the Dentist," and added the query: "Will he do it?" Dr. Mayo, no doubt, had in mind the removal of all foci of infection from the oral cavity, the avoidance of secondary infection, and the consequent elimination of many serious diseases occurring in other parts of the body as a *direct* result of dental disease.

Dr. Mayo's statement *may*, however, be applied with *equal* force to the *preventive side of dental practice*. Many systemic diseases and dental diseases are doubtless of common origin.

Whether civilized or uncivilized, mankind has always practised more or less of prevention, though it has remained for the present generation to fully appreciate the value of preventive measures and to attempt their practice in a systematic and organized way. To-day we find Governments, official bodies, voluntary organizations, and individual citizens, united in an endeavor to put into effect preventive measures for safety and health.

Is Dentistry to lag behind in this great forward movement? We believe not! Great as have been the advances of the Dental Profession in the past, Dentistry stands to-day upon the threshold of an even greater and more worthy development. The query of Dr. Mayo, "Will the Dentist do it?" is a challenge to each one of us. In the abstract, every man answers "Yes!"—BUT HOW?

Preventive Dentistry, embracing as it does the important subject of diet, is worthy of special study, that our preventive ideals as Dentists may assume more concrete form and find their expression in the actual practice of Preventive Dentistry, to the great advantage, the sincere appreciation, and improved health of our patients, and of the public generally.

During the past 50 years Dentistry has made remarkable strides along surgical lines. Dental SURGERY, however, was the Dentistry of YESTERDAY. Dental MEDICINE *will be* the Dentistry of TO-MORROW.



## OPPORTUNITIES

Accepted or Rejected

ALL who are well-born are created equal. We are not all blessed with the same talents, but we all possess talents. We are all born with the same essential powers of mind, and the seeming difference in after life is all due to accepted or rejected opportunities for training and development.



HAROLD KEITH BOX, L.D.S., D.D.S., Ph.D.  
*Professor of Dental Pathology and Periodontia, Royal  
College of Dental Surgeons, Toronto.*

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, JULY, 1921

No. 7

## The Evolution of the Periodontal Pus-Pocket

HAROLD KEITH BOX, L.D.S., D.D.S., PH.D., TORONTO.

*Professor of Dental Pathology and Periodontia, Royal College of  
Dental Surgeons, Instructor in Periodontia, Columbia  
University, New York City.*

ULCERATIVE pockets overlying cementum may be defined as the lesions produced by the establishment of infection in the cemental gingivae and pericementum, whereby, through suppurative process, these tissues have been detached from the cementum. Dependant upon the amount and nature of the loss of tissue, ulcerative pockets may be classified into two main groups—the first, in which the lesion is confined to the cemental gingiva, and the second, in which extension of the ulcerative process has taken place into the pericementum. An understanding of pocket formation in dental periclasia is impossible without an adequate conception of the histological complex in which the pathological changes are initiated. The importance of the gingivae in their relationship to the pericementum, both in health and disease, necessitates the following short description of their minute anatomy.

The tissues of the oral cavity known as the gingivae include all the soft tissues which invest the cervical portions of the crowns and roots of the teeth, to the level of the crests of the alveolar process. The main bulk of the gingival tissue rests upon the crests of the alveolar process, and is supported by them. From these crests to the gingival line, the amelo-cemental junction, and attached to the cementum, is that division of these tissues known as the cemental gingivae. The cemental gingivae are attached to the alveolar crests by fibres of the periosteum and certain principal fibres which are inserted in the cementum.

Rising from the cemental gingivae and supported by them are wedge-shaped tissue extensions which encircle the enamel at the cervix. These are known as the marginal gingivae. By their contact with the enamel they form the so-called gingival crevice, the deepest portion of which is bounded by the first attachment of the cemental gingivae at the amelo-cemental junction.

The epithelium which covers the gingivae is of the stratified squamous type, and rests on a thin basement membrane. It differs from that of the gums, the tissue of which is continuous with the cemental gingiva and which covers the alveolar process, in that it becomes thicker and stronger progressively from a point approximately opposite the crest of the alveolar process to the crest of the marginal gingiva. A characteristic of the gingivae is the invagination into the epithelium of finger-like papillae of connective tissue. The distribution of the epithelium on the crevicular\* surface of the marginal gingiva is an outstanding feature, because, as a rule, it is unusually thin. Occasionally breaks can be noticed in this lining, where the epithelium is absent, and again, imperfect junctions of the crevicular epithelium with the cementum are frequently observed. These facts—its extreme thinness, the possible presence of breaks on the surface, and imperfect junctions, render this crevicular surface the weakest link in the chain of epithelial covering in the mouth.

The gingivae have an extremely rich blood supply, which is derived from the pericemental and periosteal blood-vessels, as well as those of the adjoining gums. The connective tissue of each papilla carries an arteriole which passes to its extremity, where it terminates in a capillary loop and returns as a vein. This circulatory apparatus is designed to carry nourishment to all the epithelial cells. It is commonly seen in the microscopic study of these tissues, that the cells separating the capillary loops from the saliva are very few in number.

The progression of the inflammatory process in the evolution of a pus-pocket may be classified into the following four stages:

1. Early inflammatory reaction following the initial invasion of bacteria.
2. Loss of some of the epithelial lining at the extremity of the gingival crevice, and the establishment of ulceration in the cemental gingiva.
3. Progressive loss of tissue, and the formation of a pocket in the cemental gingiva.
4. Extension of the pocket into the pericementum.

Bacterial invasion of the gingivae, in practically all cases except the phagedenic type, takes place from the gingival crevice through the crevicular surface of the marginal gingiva. A microscopic examination of a large number of early lesions in the gingivae has demonstrated to the essayist that the great majority of infections

\*Crevicular: Adjective—relating to the gingival crevice



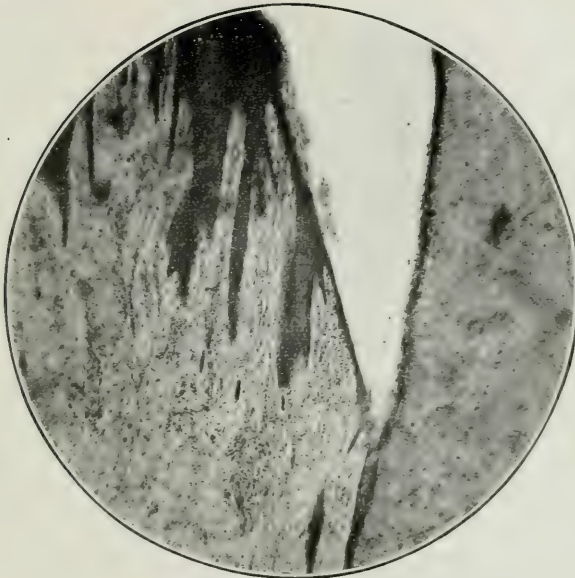


FIG. NO. 1.

In Fig. No. 1 is shown the gingival crevice and the attachment of the marginal gingiva to the tooth. Note the extremely thin protective covering of stratified squamous epithelium on the crevicular surface of the marginal gingiva.

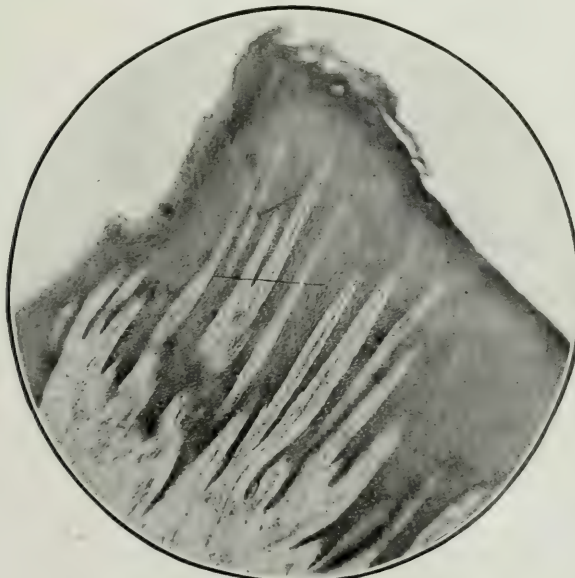


FIG. NO. 2.

In Fig No. 2, showing the marginal gingiva, note the extremely thick covering of epithelium on the outer surface. Into this epithelium are projected long finger-like extensions of the underlying connective tissue.

occur at the base of the gingival crevice, where, through imperfect junction of the epithelial cells with the cementum, or because of the extreme thinness of this defensive covering, the tissue underlying this area is not adequately protected. The earliest lesion which occurs following bacterial invasion is a minute area of small cell infiltration, the inflammatory reaction to the micro-organisms. Leucocytes escape from this area through the thin layer of epithelium, and appear, along with desquamated epithelial cells, on the crevicular surface of the marginal gingiva.

When, through progression of the inflammatory process, ulceration has been established at the base of the gingival crevice, after the necrotic epithelium is cast off, the attachment of the principal fibres of the cemental gingiva, at the gingival line, is involved. Due to the action of ferments liberated, either by the polymorphonuclear leucocytes or by bacteria, tissue solution takes place, resulting in the stripping of gingival tissue from the cementum and the formation of a small pocket. Penetration of this pocket into the deeper tissues, following further bacterial invasion, results in the complete loss of attachment of the cemental gingiva to the cementum, and in the establishment of ulceration and pocket formation in the pericementum. The soft tissues covering the denuded cementum present a surface which is in a state of constant inflammatory reaction. This varies within wide limits, depending upon the amount and nature of the injurious agents and on the severity and character of the injury. The cementum underlying the pocket and from which the soft tissues have been detached, always presents a septic surface. This is due to the frequency of serum deposits and to the retained ends of the principal fibres in the insertion layer.

The type of exudation from periodontal pockets is commonly known as pus, and is made up of leucocytes in abundance, serum in varying quantities, fibrin usually of scant amount, and living and dead bacteria. Of the leucocytes, the polymorphonuclear predominates, although endothelial leucocytes and lymphocytes may be fairly abundant.

It must not be overlooked that when a pus-pocket is present in the pericementum, it is usually but a part of a more involved pathological complex. While the stages in the histo-pathology of the actual pus-pocket are essentially the same in all cases, the formation of a pus-pocket in the pericementum is a phenomenon preceded in many cases by much more complicated and deeper changes than simple gingivitis. The ideal requisites for rapid and deep pocket extension are alveolar resorption, lowered resistance in all or part of the pericementum, and gingivitis. Lowered resistance in the pericementum is frequently brought about by excessive mechanical function of the teeth or, upon the other hand, by their disuse.

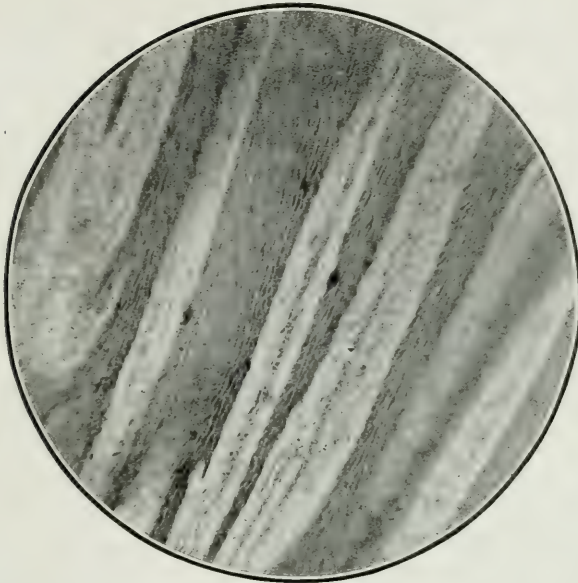


FIG. NO. 3.

Fig. No. 3 is a high magnification of the connective tissue extensions into the epithelium. Each papilla supports a circulatory system comprising an arteriole, capillary loop, and returning vein. The blood is carried by the arteriole to the end of the connective tissue papilla, passing there through the capillary into the returning vein.

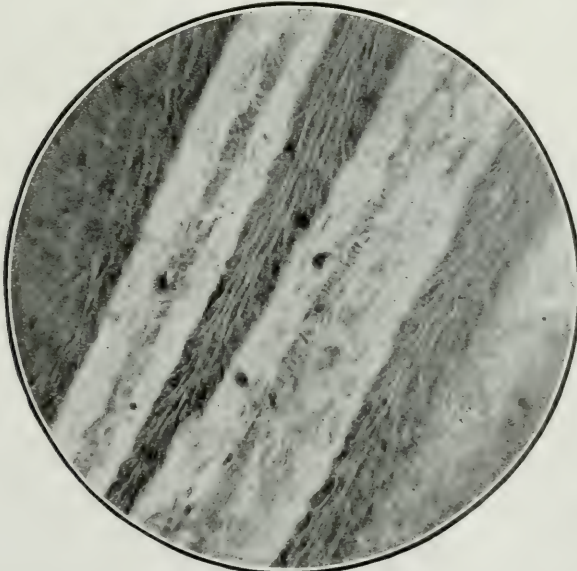


FIG. NO. 4.

Fig No. 4 is a very high magnification of two connective tissue papillae. In one, may be seen quite distinctly, the arteriole and returning vein lying side by side.



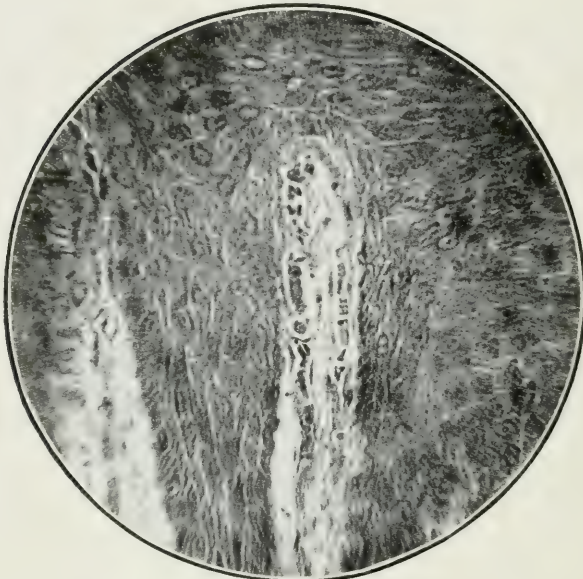


FIG. NO. 5.

Fig. No. 5 is a good example of a high magnification of the capillary loop at the extremity of one of the connective tissue papillae. The bulk of the tissue shown in this slide is made up of epithelial cells.

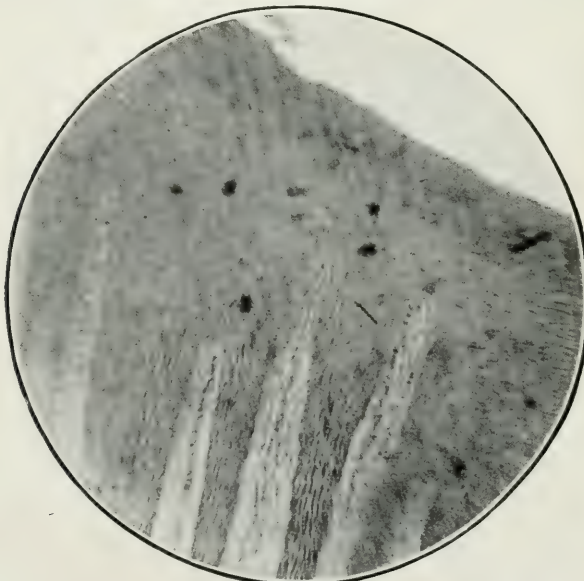


FIG. NO. 6.

Fig. No. 6 shows the very thin layer of epithelium which covers the capillary loops and protects the blood-stream from the oral fluids. This arrangement, which is ideal from the standpoint of nourishment of the epithelium, becomes a weakness in certain infective processes, evidenced in phagedenic gingivitis, and accounts, in part, for the rapid extension of ulceration.



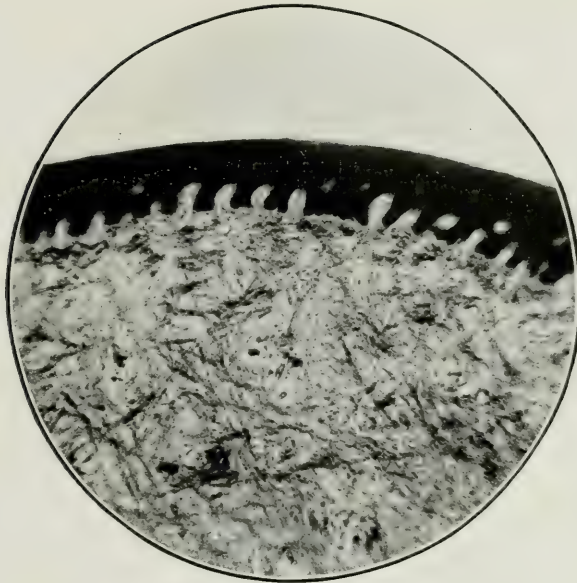


FIG. NO. 7.

Fig. No. 7.—That division of the soft tissues overlying the alveolar process to its crest is known as the gums. Fig. No. 7 demonstrates the interlaced mat of connective tissue fibres which holds this tissue to the process.

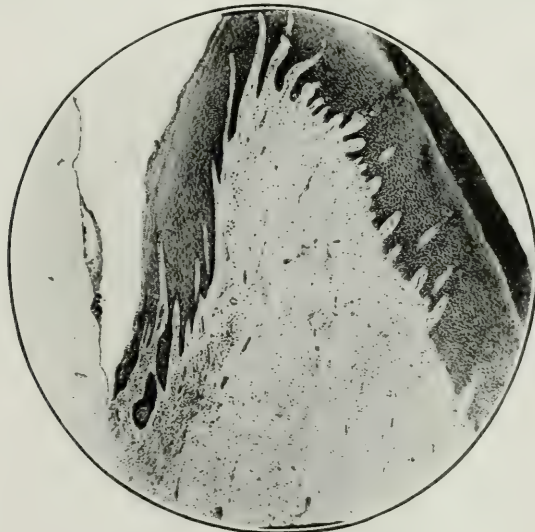


FIG. NO. 8.

Fig. No. 8.—Infection of the gingivae, as a rule, takes place at the extremity of the gingival crevice. A defective junction of the epithelium on the crevicular surface of the marginal gingival with the tooth, creates an easy avenue for bacterial invasion at this point. In Fig. 8, there is shown an example of an imperfect junction of the epithelium with the tooth.

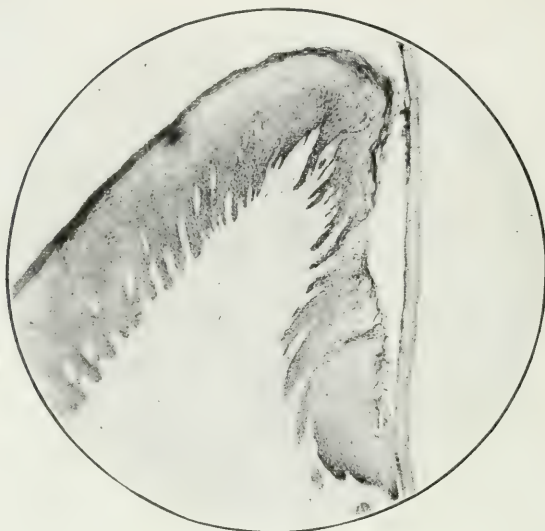


FIG. NO. 9.

Fig. No. 9.—Occasionally, besides the weaknesses of the gingivae to infection, just described, viz., an extremely thin epithelial covering on the crevicular surface, and an imperfect junction, a third one is noted. In this class, breaks in the crevicular epithelium are found, in which the underlying connective tissue is devoid of epithelial protection. Two such breaks may be seen in Fig. No. 9.

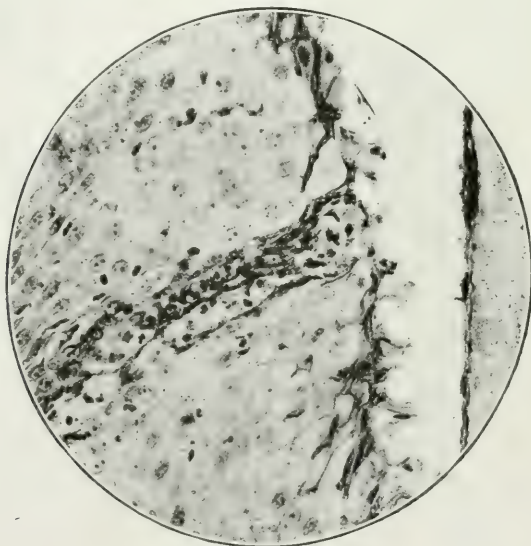


FIG. NO. 10.

Fig. No. 10.—This figure is a very high magnification of one of the breaks described in Fig. No. 9. Note the blood-vessel extending almost to the gingival crevice. Clumps of bacteria on the tooth surface just opposite are demonstrated.

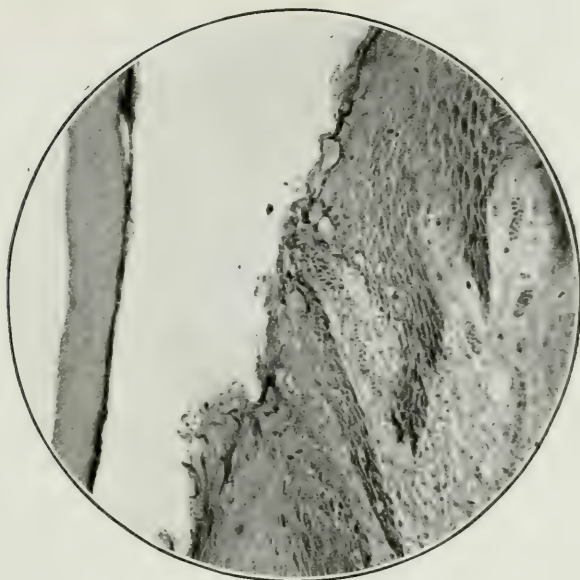


FIG. NO. 11.

Fig. No. 11.—In Fig. No. 11, another such break in the epithelial covering is evidenced. Again, note the blood-vessel passing to the gingival crevice.



FIG. NO. 12.

Fig. No. 12.—Several breaks are shown in Fig. No. 12. Such histological defects must, in certain cases, be regarded as factors in gingival infection.

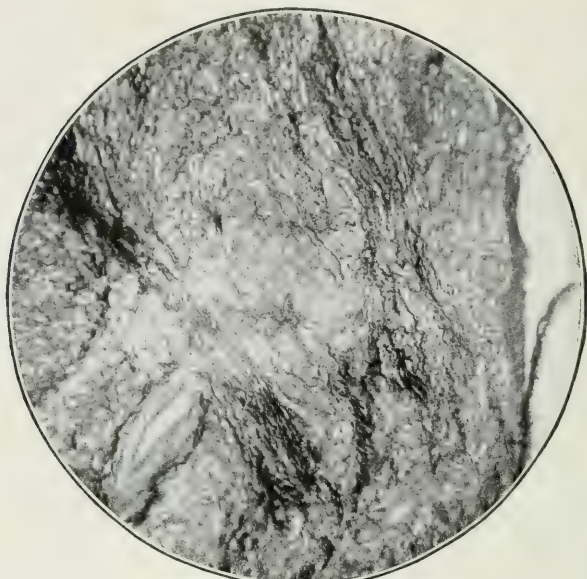
**FIG. NO. 13.**

Fig No. 13.—In the marginal gingiva is found the first group of principal fibres having their insertion in the cementum. They pass outward from the cementum and extend toward the crest of the marginal gingiva. The function of this group is to hold the marginal gingiva in close apposition with the enamel surface. This grouping of fibres is demonstrated in Fig. No. 13.

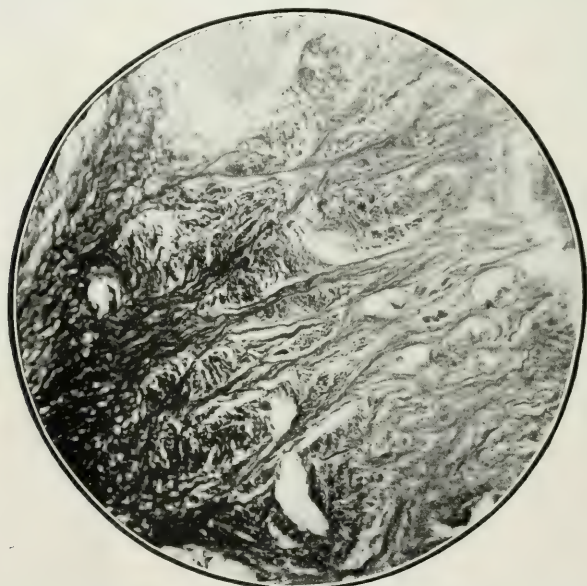
**FIG. NO. 14.**

Fig. No. 14.—In Fig. No. 14, is shown the second group of principal fibres, which passes mesio-distally from tooth to tooth through the cemental gingiva. It helps to hold the contact points of the teeth together, and is known as the "trans-septal" group.



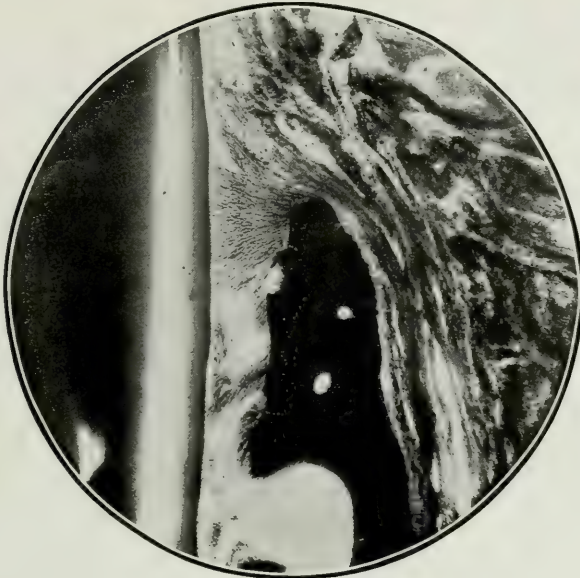
**FIG. NO. 15.**

Fig. No. 15.—Next in order, is found a large, well-defined grouping of fibres, which originates in the cementum and passes to its attachment in the crest of the alveolar process. It is termed the "alveolar crest" group, and serves to prevent rotation of the tooth in its alveolus. In Fig. No. 15, this group is sharply defined. Note the line of demarcation between the dentine and the cementum, where, in the preparation of the section, the cementum has been separated from the dentine.

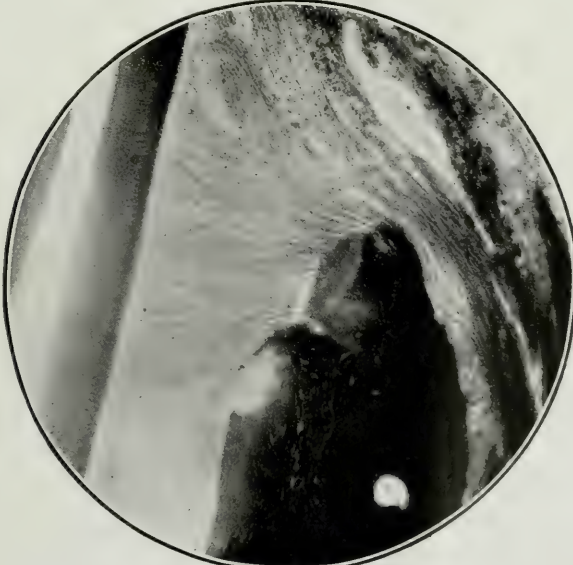
**FIG. NO. 16.**

Fig. No. 16 is a higher magnification of the same group, and shows in detail, the courses of its many fibres.

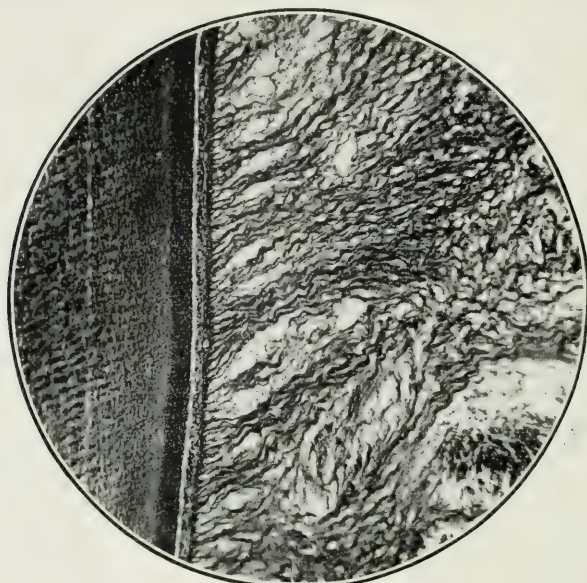


FIG. NO. 17.

Fig. No. 17.—Apical to the “alveolar crest” group, are found the “horizontal” and “oblique” groups, which pass from the cementum to the wall of the alveolar process. The “oblique” group is by far the larger, and constitutes the bulk of the pericementum. The fibres, from their attachment to the process, pass in a slightly apical direction to the tooth. This grouping is shown in Fig. No. 17.

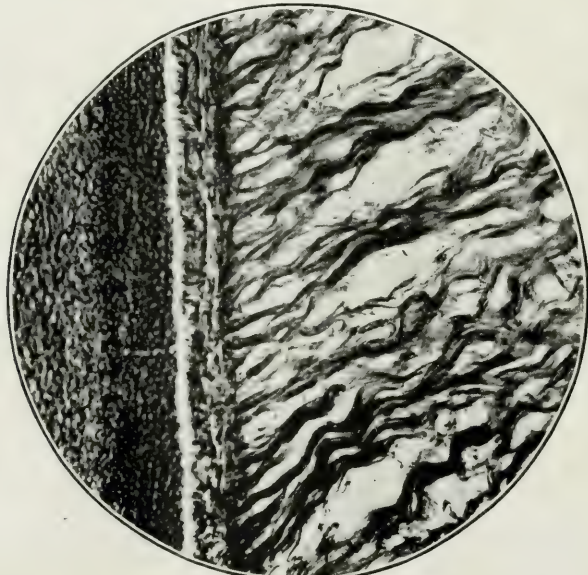


FIG. NO. 18.

In Fig No. 18 these fibres are shown highly magnified. Their function is to support the tooth during occlusal strain.

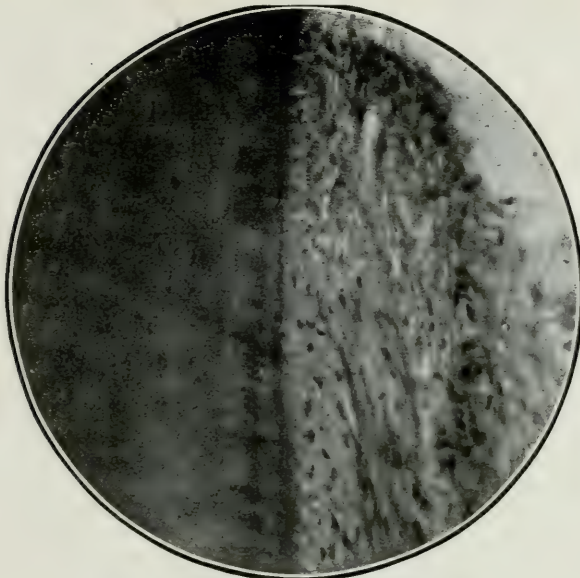


FIG. NO. 19.

Fig No. 19 demonstrates the insertion of the principal fibres of the gingivae and pericementum into the cementum. The cementum, upon the loss of the principal fibres in pocket formation, presents a pitted surface which affords an ideal lodging place for bacteria and their products.

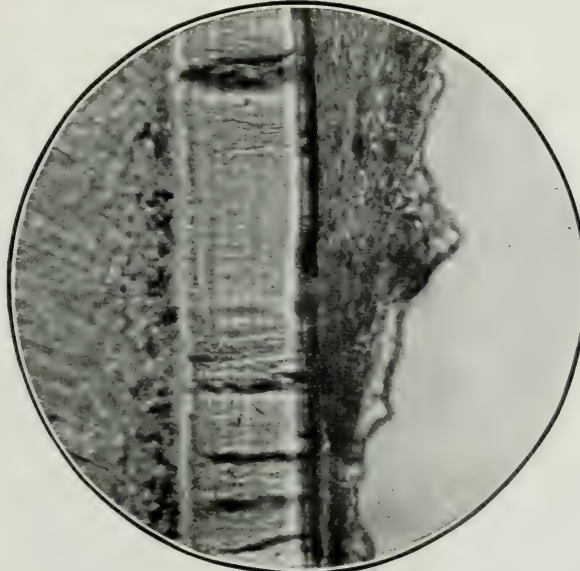


FIG. NO. 20.

Fig. No. 20.—The cementum underlying the average pus-pocket is practically homogeneous. It differs from the apical cementum in that it usually contains no cement corpuscles. It is extremely thin, from a clinical standpoint, and in many cases is about the same thickness as a human scalp hair. In Fig. No. 20, a section of this cementum with some attached pericementum is shown.



The progression of the inflammatory process in the evolution of a pus-pocket, may be classified into the following four stages: 1. Early inflammatory reaction following the initial invasion of bacteria. 2. Loss of some of the epithelial lining at the extremity of the gingival crevice, and the establishment of ulceration in the cemental gingiva. 3. Progressive loss of tissue, and the formation of a pocket in the cemental gingiva. 4. Extension of the pocket into the pericementum.

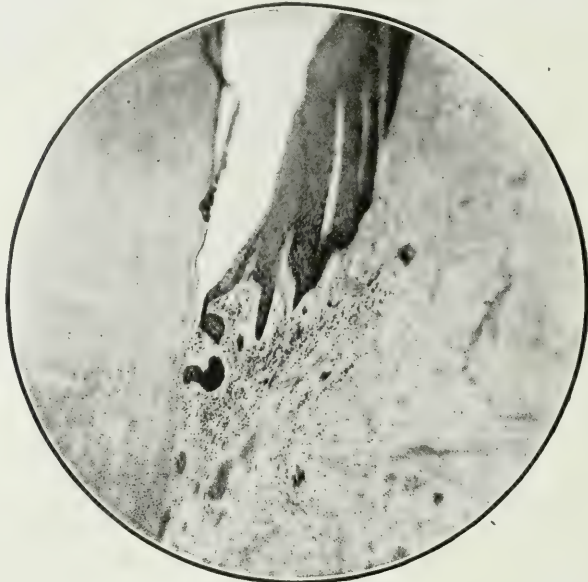


FIG. NO. 21.

Fig. No. 21.—Bacterial invasion of the gingivae, as a rule, takes place at the basal extremity of the gingival crevice. In Fig. No. 21, a faulty junction of the crevicular epithelium with the tooth is shown, and, in the gingival tissue immediately underlying it, may be noted a minute area of small cell infiltration, the inflammatory reaction to the invading micro-organisms. This is the earliest lesion which occurs in the evolution of a pus-pocket, and cannot be demonstrated clinically.

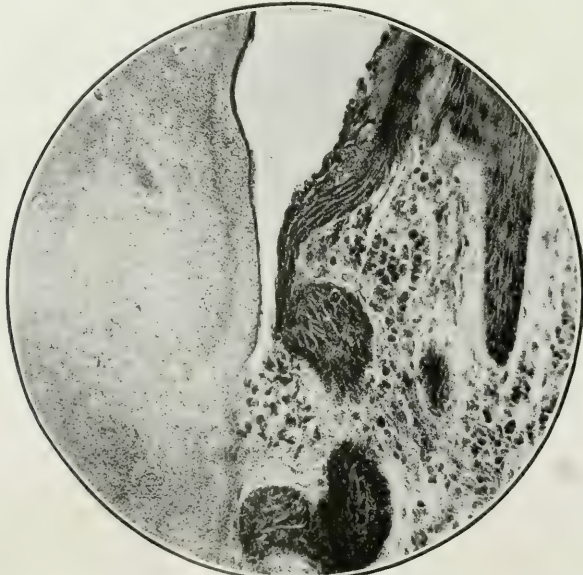


FIG. NO. 22.

Fig. No. 22.—In Fig. No. 22 a higher magnification of the foregoing lesion is shown. The imperfection of the junction of the epithelium with the tooth is plainly evidenced. The infiltration is of the plasma cell type.





FIG. NO. 23.

Fig. No. 23.—In Fig. No. 23 a condition is shown which may be regarded as a second stage of inflammatory progression in the evolution of a pus-pocket. It will be noted at once that the inflammatory infiltration is more extensive than that shown in Figures Nos. 21 and 22, and that some of the epithelium at the extremity of the gingival crevice has been lost. Superficial loss of tissue lying between the remaining epithelium and the tooth structure is taking place, the condition being one of ulceration.

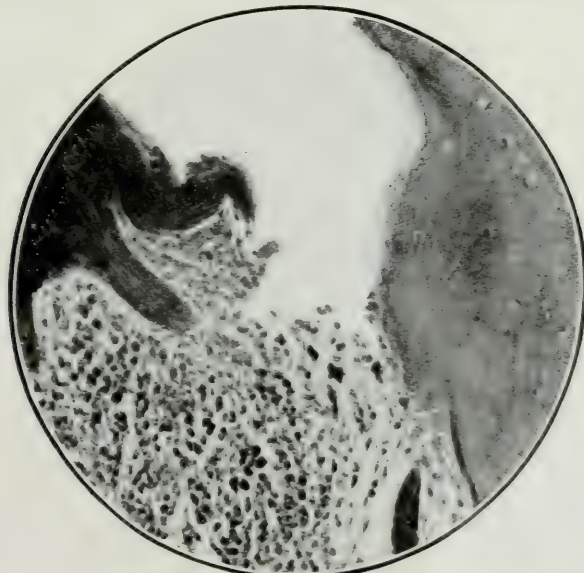


FIG. NO. 24.

Fig. No. 24.—This figure is a high magnification of the inflammatory process occurring in the tissue lying between the epithelium and the tooth, as shown in Fig. 23. It is clearly shown that some loss of tissue has taken place, and the remaining superficial tissue is in a state of ulceration.

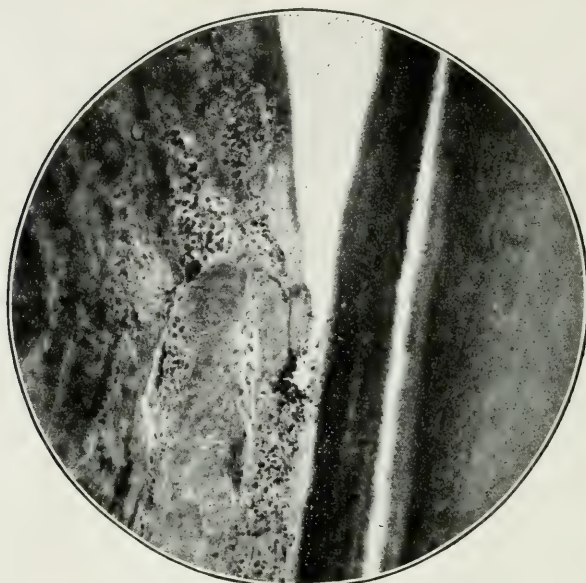


FIG NO. 25.

In Fig. No. 25, the third stage in the evolution of a pus-pocket is demonstrated. The ulcerative process has resulted in the partial denudation of cementum, and in the cemental gingiva a small pocket has been formed. Note, in this case, that extension of the ulcerative process is not proceeding along the cemental surface; and also the evidence of inflammatory reaction in advance of the pus-pocket.

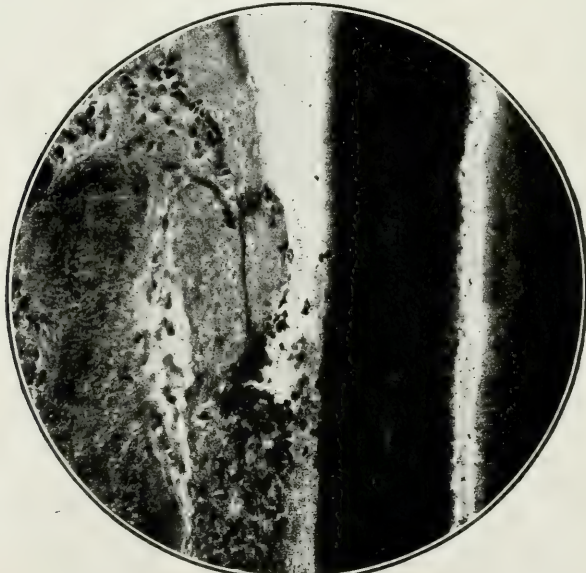


FIG. NO. 26.

Fig. No. 26 shows a high magnification of the pocket just described. Note that the pocket extends from the crevicular epithelium, which may be seen near the top of the slide, to the surface of the ulcer.

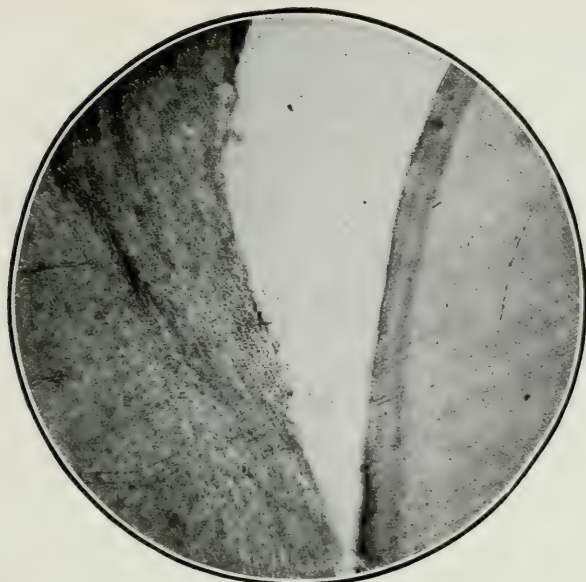


FIG. NO. 27.

In Fig No. 27 is an example of the fourth stage in the pathological evolution of a pus-pocket. Loss of tissue, denudation of cementum and pocket formation, have progressed into the pericementum. All the soft tissue facing the cemental surface is in a state of ulceration.

---

## Graduation Address—The Royal College of Dental Surgeons and the Faculty of Dentistry, University of Toronto

---

CONVOCATION HALL, FRIDAY, MAY 13, 1921.

---

BY THE HONOURABLE WILLIAM RENWICK RIDDELL, LL.D.

---

**I** CONGRATULATE the members of the graduating class on attaining the degree conferred upon them by this University, and welcome them into the goodly fellowship of her Alumni. You have now obtained one, and that not the least, of the rewards of years of honest study; and you have a right to be proud of your new status.

You have the right, too, to be proud of your profession.

Until but the other day there were, outside the Army and Navy, only three professions, three civil professions, which a gentleman could follow, liberal and learned professions—the Church, the Law and Medicine.

Dentistry, three hundred years ago, had fallen from its high



estate and had become a trade; those who practised it, barbers and others, had a certain amount of tactual, mechanical, operative skill, but little or no scientific knowledge—they were mechanics, tradesmen, and not professional men—as the Greeks were wont to put it, they were *cheirotechnai*, handicraftsmen. It was not supposed that the trade of dentistry required a college education, a simple apprenticeship was sufficient as in the case of a bricklayer or plumber—and anyone who spoke of a dentist as at all in the same rank as a physician or a lawyer would have been laughed at.

It was not till 1840 that the Baltimore College of Dental Surgery was established, the first college in the world for the scientific and systematic education of dentists. By a steady course of evolution upward, the position of your science has been improved—the greatest universities have come to recognize its importance and its standing, and gladly grant their degrees to those who prove their ability and learning.

Dentistry in achieving the distinction of a profession and a science has not lost its status as an art—technical skill is as useful and as much prized as ever, mechanical expertness is as useful as ever—but now “bright-eyed science watches round,” star-eyed science, organized knowledge, the mistress and directrix of modern civilization.

The whole concept of your mystery has changed and is changing. Beginning of old with the whole mind fixed on the teeth, as though they were entities entirely separated from and wholly independent of the rest of the body, the art applied itself to the topical care of the teeth—and ended there. “Until near the end of the 18th century, extraction was practically the only operation for toothache,” and when views became broader it still was the individual tooth which was considered. It is a far cry from the rusty turn-key to Cotton’s analgesia.

If the rest of the body was thought of at all, it was much in the same way as the body was thought of by some ancient and medieval philosophers—they are not all dead yet—as a resting place for something vastly more important. These desiderated a sound body as the temple of a sound mind—their motto was *Mens sana in corpore sano*; but it was the sound mind which they desired, and the soundness of the body was of importance only in its bearing upon the soundness of the mind.

The early dentist perhaps thought of *Dens sana in corpore sano* but it was the *Dens* he had his eye fixed upon—the body only was considered as the *situs* in which the *dens* stood and its soundness was not of importance.

“Science moves slowly, slowly creeping on from point to point”—and just as in general surgery, so in dental surgery the conception of the interrelation of the parts of the human body has grown broader and more comprehensive.



In Charmides, that most delightful of all the Dialogues of Plato, Socrates assuming the character of a physician, tells the beautiful lad who was suffering from a headache that physicians of eminence had a maxim that they could not cure the eye without curing the head, or the head without curing the whole body. The Greek had already arrived at the truth which even now not all our modern men, and still fewer of our modern women, fully appreciate, that a headache always means something more. But twenty-three centuries after the death of Socrates the thoughtful of us are almost standing upon the heights to which Socrates attained and we have at length got back almost to his principle—we cannot cure the tooth without curing the head or the head without the whole body. For sound teeth, the importance is recognized of regimen, diet, exercise, wholesome living, producing a general state of health of the body—while on the other hand, unsound teeth are now known to exercise a powerful effect for evil—perhaps a fatal influence—on the body generally: *dens sana* both requires and produces *corpus sanum*. The modern conception of the body as a collocation of cells each with a sort of individual existence might be expected to clash with this view, but the contrary is the case—it but strengthens the firm conviction of the unity of the whole—*aegrum in uno, aegrum in omnibus*; and in the like manner, the advance of your science and art naturally if not necessarily leads to differentiation in practice, to specializing in some particular branch of the profession. But this is not to separate you from the rest of those engaged in the healing art—there can be no clear line of demarcation between dentistry and medicine generally—unless you are content to be mere tradesmen, handicraftsmen, you must keep abreast of those in the other departments of healing and possess yourselves of their discoveries and advances as they of yours.

The ancient sage of whom the Pythia said not in vain that he was the wisest man, went further than his pretended authorities—quoting a mythical and imaginary Thracian, he said, “You cannot heal the body without healing the mind”—the healthy soul, *mens sana* connoted *corpus sanum*. That truth, too, we are beginning to appreciate; and if not as yet wholly in the individual, we see at least in the nation that health makes for purity and that the clean nation is sound in mind as in body—the clean nation, clean from disease, clean from infection, is the sane nation, the wise and prosperous nation.

All these considerations you must take with you; you must live and work accordingly, apply them in your association with your patients and your fellows.

You are now become of the great fellowship of University Graduates—but the winning of so great an honor does not make you the less citizens.

For more than fifty years connected more or less closely with

Universities and University life, I am more and more convinced that the future of the nation and of the world depends, as it should depend, on the University—on the output of the University.

While it is not to be expected that even those who receive the benefits of the higher and the highest education will be wholly exempt from the failings and shortcomings of our common humanity, they must needs be trained to think and to discriminate the superficial and ephemeral from the essential and eternal. In a University graduate, careful thought must go before adjudication, reasoned judgment before condemnation as deliberate and well-grounded approbation before acceptance.

We have got far away from the old system of rule by a superior class or the superior classes. "Let them obey who know not how to rule," said the proud Plantagenet; and he read well the signs of his times. Now, those who know not how to rule are not made slaves with no part in the Commonwealth except to serve and obey; they choose those who are to rule, and in no small measure direct how they are to rule. We do not say "Jack is as good as his master," but it is because Jack knows no master. Still in the nature of things there must be leaders. It is said that during the evil days of the French Revolution a mob was hastening past a house where sat with a friend one much in the public eye. "Where are they going?" said his friend. "I do not know but I must go with them, for I am their leader," was the reply. Even in that crowd there were leaders, though perhaps not those ostensibly such—no movement is purely spontaneous. There always have been and there always will be—human nature remaining the same—men to whom their fellows look for light and guidance.

And where are they to be found? Not in the cloistered shade haunted by the recluse and the misanthrope.

Herodotus tells of the envoys sent to Delphi by the Dolonci to consult the Oracle concerning a ruler. The Pythia said "The first man who offers you hospitality, take with you." Miltiades, son of Cypselus, sat by his door in the cool of the evening, and, seeing them in the highway weary, invited them into his house, and so became their King. Axylus sung by Homer who lived by the side of the road was the friend to man for he loved all—Diomedes, the mighty master of the war-cry, slew him, but he was not a failure; his name and fame are eternal, embalmed in deathless verse:

"There are hermit souls that live withdrawn  
In the place of their self content;  
There are souls like stars that dwell apart  
In a fellowless firmament;"

and they often are the very elect; but they must be few in number.

He who shuns his fellows may have a high mission, a lofty outlook, and he may be worthy of all praise. But there must be some to

mingle with the people, to know their needs at first hand, to take an immediate and not simply a mediate part in directing their thoughts and their aspirations. Those who do that, there must always be, whether worthy or unworthy, whether for good or for ill.

Is that function to be left to the ward heeler, to the boss who makes his living by it, to the party hack with no thought above the immediate success of some scheme? It is not unusual to speak contemptuously of the politician, as though it were a degradation to take part in the government of the country; a disgrace to put into practice that for which our forefathers fought and died: A Macdonald, a Mowat, a Whitney, a Laurier—these may receive commendation, for—it is said—they were statesmen. Of a surety, he was wise who first said that the difference between a politician and a statesman is that the statesman is dead.

Some one must lead; who is it to be? "Freely ye have received, freely give." The inestimable gift of civil freedom, the highest privilege an honorable man may enjoy is yours as a birthright.

"We must be free or die, who speak the tongue  
That Shakespeare spoke, the faith and morals hold  
Which Milton held."

You have been educated in an institution where thought is free as the air you breathe, you have been trained to think, your whole education has been to cast off from your mind and souls the trammels of ignorance, you have been taught to fear God and eschew evil.

*Noblesse oblige*: and as "with the same measure that ye mete withal it shall be measured to you again," so with the same measure with which it has been measured to you, with that measure, mete ye.

This University was not founded simply to give information to intending ministers, or doctors, or dentists, or lawyers or engineers. Those who bore the burden and heat of the day when this University was but a young and struggling institution did not have in view simply learned savants, acute theologians, skilful surgeons, astute and subtle lawyers. These indeed they hoped for and expected; but their desire was for men and women who should indeed know their rights, and knowing dare maintain, but who should also their duty know. Brilliant graduates, graduates of compelling ability who should make their Alma Mater famous in their own fame, their faith gave them to foresee, and they have not been disappointed; but most, they wished graduates who should recognize their duty to their God, to the world, to their country, and their fellow countrymen.

And it should be the glory of a University that from its walls go forth the leaders of the people. If the blind lead the blind both shall fall into the ditch; it is the function of a University to supply those who can see, who can and will prevent their countrymen from falling into ditches that are all too common, ditches of ignorance, ditches of



prejudice, ditches of class hatred, ditches of party and international ill-will, ditches which lead to national discord or, it may be, to bloody devastating war. "He loved his fellow men" is the greatest praise which an nonourable man should covet, if that love has been made manifest in deed and not in empty rhetoric. If love of fellowmen be not the effect of University study and training, better that the University should cease to exist. It is for the public service, the public good, that public support is given to such institutions of learning, and the public should in common honesty receive the reward which is due.

The graduates and students of the Royal College of Dental Surgeons gave themselves in full measure to the service of their country in war—the Roll of Honour is long and illustrious, many gave invaluable time and labour, many gave health and strength, and some made the supreme sacrifice that Canada might be free. Are you not called upon to give yourselves in full measure that Canada may be great, a better place to live in? Your profession calls upon you to do your utmost that Canada should be clean physically, your proud birthright of citizenship calls upon you to help to make and keep Canada clean morally, mentally, and politically.

All the problems of government have not been solved; many remain calling for the clearest thinking, the renunciation of prejudice, honest and sincere determination to do the thing that is right. "Because right is right, to follow right," is "wisdom in the scorn of consequence."

I can see many such problems—the conflict between labour and capital (or rather between some who are thought to represent labour and capital); the old but ever new question of the tariff, for no tariff can be permanent, at least not without constant defence against constant attack; the problem of the immigrants and their uplift, upon the solution of which almost certainly will depend the prosperity of the Western and perhaps of the Eastern provinces as well; prohibition, whether it prohibits or when the evil spirit of intemperance is thought to be driven out for good has he simply gone and taken with him seven other spirits more wicked than himself and have they entered into the house empty and garnished and dwelt there, so that the last state is worse than the first?

These questions must be settled, not by prejudice or appeals to old established rules and customs, but by reason, by justice and eternal right—it is righteousness which exalteth a nation in every true sense. They who settle these questions are as deserving as the United Empire Loyalists who kept this land for Britain, and held us under the flag that braved a thousand years the battle and the breeze—as the statesman who won for us responsible government—as the Fathers of Confederation who conceived and realized our magnificent Dominion, self governing, but a proud member of the far flung British Empire, the greatest secular agency for good the world has ever known:



Leadership is required not only in the broad national and even in the less extended but still great field of Provincial affairs—much of the happiness of the people depends upon the municipality. These “sucking republics,” as a former Governor called them, are the very nurseries of public spirit, of representative and responsible government—no man and no woman can afford to take no interest in the personnel of the governing body of the municipality.

There may be much to repel from active public life—there may be offensive personalities, rancorous invective, persistent misrepresentation, venomous threats—all the artillery of the worst type of politician. These are to be expected so long as human nature is constituted as it is—for there is a great deal of human nature in Canadians—but the example of a Sir Oliver Mowat, a Sir John Thompson, shows that they are not necessary weapons for a successful politician and that in the hands of others they are impotent to destroy the influence of those who can despise them.

And after all, such a price is not too much to pay for our prized freedom of speech which we hold only less dear than the freedom to live our own life in the pursuit of happiness.

It is infinitely easier now, as it was in Plato's time, to do harm than to do good—and it is not every one who can take up the challenge to public service—one must be strong in patriotism as in rectitude before he can defy evil speaking and evil thinking, detraction and defamation. But we can all help in some way, by upholding the hands of those who are earnestly seeking their country's good. Every one of you can if he will, find some way in which to repay at least in part the gifts of your country to you.—Freely ye have received, freely give.

---

### Chicago College of Dental Surgery— Class A

---

AS we go to press we learn that the Dental Educational Council rating of the Chicago College of Dental Surgery is Class A. This information will be gladly received by the C.C.D.S. Alumni, who remember their Alma Mater with affection.

Canadians are particularly interested in the progress of the College because of Dr. C. N. Johnson's many years of association with the activities of the College. That Dr. Johnson is Students' Dean, and occupies the chair of Operative Dentistry, are sufficient in themselves to enlist the interest of Canadians in the progress of the Chicago College.

# Alveolectomy

H. B. HARMS, D.D.S., OMAHA.

I DO not wish to claim anything original for this paper. It is written solely from the information that I have acquired from a more or less serious study of the work of many men who are doing this class of work and the application of this knowledge to my own practice.

In the study of this operation there does not seem to be any standardized method of operation or any set rule as to the extent of tissue that should or should not be removed. Radical operators tell us that in all cases the entire buccal and labial plate should be removed as high up as the roots of the teeth and the sockets entirely obliterated before bringing the flaps of soft tissue together. An operation of this kind is no doubt called for in some few extreme and unusual cases, but to practise such a procedure as a routine in every case will result in the ruining of many mouths, which is a serious proposition. When we see mouths a few months after such a radical operation with the tuberosities gone and the rest of the upper mouth as flat as your hand with the muscles actually pulling off the palate, it seems that some prosthodontist is going to have some trouble in fitting a denture. And when a man of the standing of Dr. R. E. Hall tells me that he has seen many cases which taxed his skill to properly fit the dentures, I wonder just who is going to take care of these patients.

The more conservative men are satisfied to give nature more of a chance to take care of some of this absorption of the alveolar process after the extraction of the teeth. This operation consists only of the removal of high points and places which cause under-cuts. The mouth is then left alone for a longer period of time until it is ready for the denture, or a second trimming is done several weeks after the first operation. This is not a bad procedure, especially for operators who are just beginning to do this operation. A little simple infiltration will often suffice for the second anaesthesia.

Between these two extremes we find the greater body of operators. On the one hand are the men who feel that a denture must be placed immediately, while on the other hand are the men who are satisfied to wait from a few weeks to a few months before constructing their dentures. This does not mean that base bite plates, or the like, should not be used in the meanwhile.

The operation as carried out in this office is briefly as follows:

The patient is anaesthetized with Nitrous Oxide and Oxygen in an upright position in the dental chair. You may call this a selfish attitude on my part if you wish. First, I prefer to operate on a patient in an upright position; second, I prefer to operate on an unconscious

patient; and third, I prefer Nitrous Oxide and Oxygen over any other general anaesthetic.

The throat is packed with gauze to prevent the swallowing of blood, etc., and assuming that we are preparing a full upper mouth for a denture, an incision is made, with a heavy lance, from the posterior border of the third molar directly backward over the tuberosity; this incision is made to prevent the tearing of the mucoperiosteum when it is reflected upward to expose the buccal and labial alveolar process.

The teeth and roots are now removed in the usual manner and the muco-periosteum reflected upward exposing as much of the buccal and labial alveolar process as is necessary to remove. All parts of the process which are sufficiently prominent to cause an under-cut, or protrusion of the upper lip, should be removed. This does not always obliterate the entire tooth socket and care is taken not to tear out the floor of the antrum or to remove the entire tuberosity in the molar region. A Ronguer forcep is used for this purpose, one that makes a long, clean, sharp cut, rather than one that bites off the process in small pieces leaving a jagged edge. This is followed by a metal trimmer on the file order to round off the edges of the bone. Except in some few unusual cases the palatal process is left intact and only made smooth along the lower border. In this work I do not believe in the use of a stone for the purpose of smoothing up the bone, and a metal bone bur in my hands has not been satisfactory. We are now ready to explore the sockets for such pathology as may be present. Should it appear that a large granuloma be present and the operator deem it advisable to remove the entire buccal plate, in this region, in order to remove it, it is easily accomplished at this time as the soft tissue is retracted and the field of operation is in plain sight. After all pathology has been removed and the bone made smooth the flaps of the soft tissue are trimmed with a pair of shears so that there will be no septum of soft tissue or ragged edges, the flaps are then brought together.

Suturing: In our office we suture for two reasons only: First, when an impression is to be taken immediately after the operation where there is danger of displacing the flaps in taking the impression. Second, we suture for such flaps that will not stay in place otherwise.

The greater per cent. of our cases are not sutured at all, and we find that the pressure of the tongue, cheeks, and lips keeps the flaps in position until a normal blood clot has formed which will then retain the flaps without further danger of displacement. With this form of anaesthesia there has been no interference with the normal coagulation time of the blood which for the average case is about four minutes. By the next day the flaps are very firmly held in place and to try to displace them would necessitate considerable force. The average time in doing such a case is about twenty-five minutes.

The average case is in good condition for an impression about the third week after the operation, this gives the tissues a chance to be-



come more nearly normal. The appearance of the mouth at this time is as though one incision was made from tuberosity and the incision healed by first intention. No claim is made to the patient that the mouth will not still undergo some changes for some time to come.

I have not seen any mouth that would not undergo some change for a greater or lesser time following this operation regardless of how it is done, and too many people have been disappointed in being told that they could have a denture made within a few days after the removal of the teeth and that the plate would be permanent. We all know how much some people will put up with in the way of wearing dentures, they sometimes come in with a plate packed with cotton or gauze and insist that it fits perfectly, but the majority of patients require better fitting dentures.

There is one feature of this operation which has greatly impressed me and that is that the very men who but a few years ago were so loudly preaching that only one or two infected teeth should be removed at a sitting are now the most radical in removing all the teeth at one sitting in order to do this operation. In this office, under this form of anaesthesia, we have never hesitated at any time to remove all the teeth that were necessary to remove at one sitting, and our clinical results have proven to our satisfaction, at least, that the reaction has not been any greater or more pronounced than when only one or two infected teeth have been removed under a local anesthetic. In those cases in which we have divided the extraction it has been done, only, to avoid an argument with the patient, their dentist or physician.

#### Conclusions:

- (1) There is no standardized operation of Alveolectomy.
- (2) A too radical operation will ruin the mouth for the fitting of a denture.
- (3) To divide it into two operations is not bad practice.
- (4) The use of a stone on bone is contra-indicated.
- (5) All pathology should be removed.
- (6) Suturing is a matter of individual choice.
- (7) The normal blood clot is to be encouraged.
- (8) The palatal process is left intact.
- (9) The immediate appearance of the operation with sutures in place is spectacular but often misleading.
- (10) Results should be judged later when the mouth has had time to heal.
- (11) The impression should be taken within two hours following the operation or left for several days until the swelling has subsided.—*Nebraska Dental News*.

---

TO REMOVE STAINS OF IODINE.—Iodine stain can easily be removed from dental napkins and other fabrics by washing the spots in ammonia water.—*H. A. Cross, Chicago*.



## Technique for Administration of Nitrous Oxide and Oxygen in Major Surgery

H. B. HARMS, D.D.S., OMAHA.

**I**N describing this technique of administering Nitrous Oxide and Oxygen for major surgical operations, in this series of cases, I wish to state that I have no quarrel with anyone who has a more scientific method of administering this anaesthetic.

I will describe to you briefly how I handle this anaesthetic for major surgery and my results from a practical standpoint will speak for themselves.

The method of administration is similar to that of the Gatch method.

It is important and very necessary, especially where or when good relaxation is desired, that the patient be given a pre-anaesthetic dose of some hypnotic, usually morphine with atrophine one-half hour before beginning the anaesthetic.

The mask is fitted to the patient's face, care is taken to prevent admission of air at the sides of the nose.

The air valve on the inhaler is open until the Nitrous Oxide is admitted from the cylinder. At this time the air valve is closed and the gas is allowed to flow into the bag which becomes inflated. The patient inhaling Nitrous Oxide from the bag and exhaling out through the exhalation valve. As soon as the patient shows signs of becoming anaesthetized a small amount of oxygen from the oxygen cylinder is allowed to enter the bag and at the same time the exhalation valve is closed tight so that the patient exhales into the bag. This is known as rebreathing.

We must remember that a patient can only breath Nitrous Oxide alone when all air and oxygen is excluded for fifty-six seconds, according to Hewitt, at which time oxygen in some form must be admitted or the patient will become asphyxiated. By admitting a small amount of oxygen during the induction period there is less danger of carrying the patient too deep.

A better anaesthesia and better relaxation will prevail throughout the operation if the anaesthetist is given a little time in which to thoroughly anaesthetize and relax his patient before the surgical procedure is attempted. While it is true that a patient may be anaesthetized in one minute it is better to use at least five minutes to have everything running smoothly and the reflexes given time to become abolished.

I wish to go on record here and now as saying that color (cyanosis) is a fooler and not a true sign of anaesthesia. I mean by that, that one patient may be deeply cyanotic and still be conscious of all

that is going on, in other words the patient is asphyxiated and not anaesthetized. On the other hand an anemic patient may be over anaesthetized and not be cyanotic.

In this form of anaesthesia no one sign or symptom can be relied upon to tell us when the patient is properly anaesthetized. We must note the reflexes of the eye, the character of the breathing, muscular tone, and last of all color of the features (cyanosis).

There are two ways of getting relaxation with this form of anaesthesia:

(1) The first and most common method used is to add to the Nitrous Oxide and Oxygen a few drops of ether.

(2) The method of McKesson, which is to anaesthetize the patient to the point of saturation and then lighten the anaesthesia until the proper surgical stage of anaesthesia has been reached.

Neither of these methods should be used by anyone except an expert anaesthetist. In the first method few but an expert do recognize the difference between over oxygenation and ether flush which if not recognized will result in over anaesthetizing the patient and abolishing respiratory reflexes. I know of at least one instance where this has occurred.

An anaesthetist using the second method (McKesson) must be thoroughly familiar with the quick action of the anaesthetic and signs and symptoms of the patient during this form of anaesthesia.

I am very much in favor from my own experience of some form of rebreathing with this anaesthetic during major surgical operations. By so doing we conserve the carbon-dioxide which is not a waste product but rather a stimulant to respiration and a factor to be considered in case of shock. Where the rebreathing method has been used I have never seen a patient show sign of shock or the temperature of the body lowered and most of my cases have been with patients that were very poor risks.

The length of time that a patient may rebreathe in a bag of this size depends entirely upon the patient; some patients can stand but very little rebreathing whereas others may be able to rebreath four minutes in a bag of this size. Please remember that we are now dealing with three gases in this bag: (1) Nitrous Oxide, (2) Oxygen, (3) Carbondioxide. The oxygen is being continually used up and replaced by carbon-dioxide while the nitrous oxide remains stable, does not change. It is therefore necessary that the contents of the bag be changed for fresh nitrous oxide and oxygen, otherwise, we would soon have the bag containing only nitrous oxide and carbon-dioxide and a stage of asphyxiation rather than anaesthesia.

The exhalation valve is then opened and the patient exhales each breath into the air until the bag is empty. The bag is then filled with a fresh mixture of gases which the patient again rebreathes. No attempt is made to measure the exact percentage of oxygen given.

This is regarded as unnecessary, it is perfectly easy to add directly from the oxygen cylinder exactly the right amount of this gas to each bag of nitrous oxide.

The apparatus which I am using is devoid of all clockwork, dials, indicators, pressure regulators, percentage gauges, and the like. My patient's symptoms are my guide as to the amount, percentage and rate of the anaesthetic that I should use.

All that is needed to successfully maintain surgical anaesthesia with Nitrous Oxide and Oxygen by the above method is an ordinary accurately fitting face piece that will also allow rebreathing when indicated and a rubber bag. The bag is kept filled with Nitrous Oxide and a puff of Oxygen is given whenever indicated by cyanosis or active reflexes.

While this apparatus has been used in thousands of cases with satisfactory results, from the description of the apparatus and the method of administration as given above it can be readily perceived that unless the strictest attention is given to the administration, flaws will occur to mar the fixed plane of anaesthesia that has been aimed for.—*Nebraska Dental News*.

---

## On Being a Good Sport

---

THE expression is not easily defined, but in a general way we know its meaning explicitly enough. It has no necessary connection with the playing of games, unless life itself be looked upon as a game. The good sport is the man who can win without being offensive or boastful, who can lose without whining or apology, who takes his full share of the knocks and tasks of life, faces the music when he has to without flinching, never tries to get out of trouble by going back on a friend, and does it all, not in grim determination, but with a disarming smile on his face as though he really enjoyed it.

The good sport always gives the other fellow a chance to win his laurels, and never hogs the game. He sees life as a big, broad, generous place, with room and opportunity in it for every man, woman and child, and one of the real sources of his joy and happiness is the prosperity and happiness of other people. He doesn't believe in putting fences round too many plots, and has a theory that the things he should hoard up just for himself alone are very few indeed. To give another man a chance to get on, even by forgetting his own selfish interests, is one of the deep-rooted instincts of his life.

But the thing I like most about the good sport is that he cuts the heroics out of life, makes no parade of anything, dresses himself up in the ordinary garb of humanity, and successfully hides the fact that there is anything wonderful about himself. He follows the good advice of the Good Master and when he has been fasting makes himself



look as if he was just coming from a wedding; when he has done some specially hard or self-sacrificing thing he just laughs and says it was nothing. He doesn't take himself too seriously; he doesn't make his goodness offensive by calling special attention to it; he does a whole host of good deeds under the cover of darkness. And somehow his good deeds have spice in them; they are not the cloying, sweet kind that have the over-pious look to them. He is—in fact he is a real good sport, and I wish that you and I could be more like him.—Guardian.

---

### Inquiry Into the Causal Relationship Between Initial Dental and Oral Infections and Certain Other Diseases

---

THE New York State Dental Society and the Metropolitan Life Insurance Company are co-operating in a study of dental and oral infections as causative factors in certain acute and chronic diseases. The study is confined to fatal cases. It is proposed to send a sufficient number of letters of inquiry to physicians in cases in which the causes of death are diseases which are known sometimes to follow dental and oral infection. The physician will be asked to state, in each instance, whether the reported causes of death were direct sequelae or in any way dependent upon the initial infections of the teeth or buccal cavity. When enough replies are received to afford a safe basis for a conclusion, the facts will be tabulated and published.

It is recognized that in a considerable number of instances dental and mouth diseases initiate morbid processes in other vital organs which ultimately result in death. In such cases, physicians have been known to neglect to record the part which the original infections have played. Very few records of authentic cases where dental diseases caused death are, therefore, at hand. There are many indications that they do play a significant part. This investigation is instituted to help determine to what extent dental disease is a primary condition. Many cases where it is contributory to other diseases will, of necessity, be recorded.

Physicians who have knowledge of well authenticated cases of serious illness and of death which resulted from conditions having their origin in mouth and dental infections are requested to be good enough to send a record of such cases to the Statistical Bureau of The Metropolitan Life Insurance Company.



# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## THE DENTIST AT THIRTY-FIVE.

EIGHT dentists in every ten who live to be thirty-five years of age will live to be fifty-five years old, and those living at the age of fifty-five will average to live to be seventy-two. From the age of thirty-five to the age of fifty-five these dentists should earn more than their expenses. Then, if ever, their earnings must be sufficiently greater than their expenditures to recompense the cost of their education and to provide a surplus of money which will support them after they become unable to earn more than their expenses. With rare exceptions, dentists will have acquired no surplus up to the age of thirty-five, and will be unable to acquire one after fifty-five.

From the age of fifty-five to the age of sixty-five, the average dentist will earn no more than the amount of his necessary expenses. After the age of sixty-five, he will be increasingly dependent upon the surplus accumulated before the age of fifty-five. If he does not have such a surplus, he will be in the position of 97 per cent of the American people, who, after sixty-five, are dependent upon friends or charity for the necessities of life. These figures have been obtained by averaging a great number of lives, and the percentage of error is very small. It will be safer for a dentist to plan his conduct on these averages than on any individual conviction of his own superiority to the average.

The figures apply with greatest force to the dentist who seeks to live a life well-balanced between work and recreation, so that his physical vigor is well maintained, and who seeks to keep sufficiently abreast of the advances of his profession to be able to render a good quality of service—at least in the forms of dentistry he practises. It is by no means certain that they do not apply equally to dentists who work unceasingly, with no attention to recreation, but this application is not so well-established.

In the well-balanced life, it is doubtful whether the dentist can

average more than two thousand office hours for each of the years between the ages of thirty-five and fifty-five. It is growing increasingly clear that not more than one thousand of these hours, yearly, will be income hours. In offices where careful records have been kept for several years, the average is about nine hundred and fifty income hours per year per dentist.

The dentist, then, at the age of thirty-five years, has for sale one thousand income hours per year for twenty years,—twenty thousand income hours in all. From the sale of these hours he must recoup an expense for special education and office equipment of about five thousand dollars; must meet all his living expenses, including the education of any children and any luxuries by which he may be beguiled, and lay aside, in the form of income-producing securities, enough money to support him after the age of sixty-five.

To do this, the business conduct of each hour must receive the most intense cultivation. If the dentist at thirty-five is *not* willing to enter upon the intelligent and intensive cultivation of his twenty thousand hours, the chance of his acquiring a surplus by the age of fifty-five is very small. The plan is to keep a careful record of all office expenses, set a proper remuneration, add to these at least one thousand dollars per year for the old age surplus; divide the sum of these items by one thousand and see that the minimum fees are at least equal to the amount obtained by the division. Having established such basis as regards fees it is then necessary to collect such fees; to keep books which will show a profit and loss account; to live within the established remuneration; to unswervingly save the surplus and, avoiding all wild-cat schemes, invest the money in securities approved by a reputable banker.

The necessity for some such plan is evidenced by the fact that in one city in the United States there are to-day five hundred dentists old enough to be in good practice who are living in straitened circumstances and who have no hope of a competence in old age.—G. W. Clapp, D.D.S. (*in Dental Digest*).

#### TOBACCO SMOKE AS A MOUTH DISINFECTANT.

PROFESSOR V. PUNTONI, of the University of Rome, has undertaken some experiments with the object of ascertaining the real action of tobacco smoke as a disinfectant, under conditions similar to those which exist in the oral cavity. The results of these experiments are interesting. In the first place, it was found that the strikingly disinfectant power that tobacco smoke exercised *in vitro* did not occur to the same extent in the mouth of the smoker, and the most that could be said was that a bactericidal action was only shown to follow the consumption of very large quantities of tobacco, and then

only on the micro-organism of least resistance, such as the meningococcus and cholera vibrio.

It is not admissible that microbes having the resistance of *B. typhosus* or greater can be killed in the mouth by tobacco smoke, and it is absurd to think that the bactericidal action of the smoke could manifest itself in the respiratory tract as a sequel to inhalation. The different qualities of tobacco made use of in these experiments showed a disinfecting power almost equal in relation to the weight of tobacco used; denicotinised cigars acted just as powerfully as ordinary ones. The smoke of tobacco completely decolorised by filtration through compressed cotton-wool retained a marked bactericidal action, notwithstanding the loss of all the nicotine and tar products, which are the two elements possessing definite disinfecting power. The bactericidal substances contained in this decolorised smoke are soluble in water, one of them being capable of distillation at 100 degrees F., and identical with formaldehyde, the other not capable of distillation was pyrrol, the bactericidal action of which as a component of tobacco smoke, and hitherto unknown, is important.—*The Dental Record*.

#### THE WIRE CLASP VS. THE CAST CLASP.

**D**R. W. H. JORDAN, in "The Cosmos," gives reasons why the wire clasp should be used in all partial restoration. These are:

The wire clasp is less liable to cause disintegration of tooth tissue, because it has but a line of contact on the tooth surface, whereas the cast clasp covers two-thirds of the surface.

The wire clasp allows for natural tooth movement. The cast clasp has no motion under stress; that is if the cast clasp is properly made.

The wire clasp puts the least strain on the abutments, because it allows the saddle to receive nearly all the force of mastication. The cast clasp does not allow for this because of its rigidity.

The wire clasp has a greater range of possible applications because it may be used no matter how badly the abutments are tipped. No strength is lost. The cast clasp can only be used where the teeth are parallel.

The wire clasp is practically self-cleansing because it is round and allows for motion. The cast clasp does not move and has a flat surface.

The wire clasp, because of its limited motion, is ideal in cantilever restorations; whereas the cast clasp, on account of its rigidity, is never indicated in restorations of this type.

The wire clasp is less conspicuous because it is round and may be placed near the gingival. The cast clasp, covering much of the tooth, is very conspicuous.

## DANGERS ENCOUNTERED IN THE USE OF ADRENALIN.

**A**DRENALIN was first introduced in 1897 by Abel; it is known by many different names, as Epinephrin, Suprarenen, etc. It is the product of the adrenal gland of the sheep or ox—a gland of internal secretion situated upon the kidney. Up to the present time little is known about the action which these glands have, except that they excite other organs of the body to become active. Advantage is taken of the fact that this product of the adrenal gland (an alkaloid—a crystalline basic substance having the formula  $(C_{10}H_{15}NO^3)$ ) when injected into the body, raises blood pressure.

The dentist, however, does not use the drug for this purpose, but in conjunction with local anesthetics. The object he wishes to gain is to cause local anaemia, i.e., shutting off the blood supply to the field of the operation. By so doing, two objects are gained: First, the anesthetic is confined locally and is not distributed over a wide area, so gaining a better anesthesia; second, the anesthetic is prevented from too quickly entering the blood stream. Arterial blood pressure is raised. The drug acts as a powerful vaso-constrictor by stimulating the smooth muscular coat of the blood vessels, thereby producing local anaemia. The drug is destroyed by the living tissue cells and the body rids itself of the poison in some unknown manner.

Adrenalin is a very unstable drug and is destroyed by light, hence must be stored in colored bottles which are to be free from alkalies and acids. If these precautions are not taken, the drug may be altered and the results may be harmful. There is a danger of sloughing because of the shutting off of the blood supply and the consequent lowering of the resistance of the tissues, even the death of some soft tissues. It is possible to cause necrosis even to the hard tissues. There is the danger of secondary haemorrhage. The use of adrenalin for patients with high blood pressure, due to organic diseases, is attended with danger, because the drug aggravates a dangerous condition. When adrenalin is taken up by the blood stream the patient sometimes shows signs of toxemia. In many cases the symptoms shown are nausea, profuse sweating, fainting, muscular tremors, and muscular contraction.

Many dentists are discarding the use of adrenalin because of the uncertain results following its administration; others have reduced the dose to such a small amount that it is doubtful whether it is capable of producing local anaemia.—*Dr. R. A. Muir (Penn.) (The Commonwealth Dental Review).*



# MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**USE OF DENTAL FLOSS.**—Dental Floss tied in two knots about one half inch apart, and worked between the teeth, readily brings out all dirt, even to the largest pieces, which smooth floss will not do.—*S. Adachi, D.D.S., Seattle, Wash.*

**REMOVING STAINS.**—To remove silver nitrate stains from oil-cloth, linoleum, hands and clothing: First paint the stain with iodine and then follow up with concentrated ammonia.

**TO SAVE TIME IN USING SANDPAPER DISCS.**—Procure an extra point of the same type for your push Mandrel and have assistant put a new disc on the extra point while you are using the other. Remove the worn disc with a quick jerk without stopping the engine and insert the new one in the same manner while the engine is still running.—*Dental Digest.*

**QUESTION.**—A lady 21 years old, healthy, with no apparent physical weakness or otherwise. All the gold foils and inlays pure gold, but turn copper color or brownish. No mouth wash seems to help it, and I clean the teeth every month to keep the color of gold natural. Can you advise a treatment?

**ANSWER.**—Regarding the case of gold fillings as reported by Dr. F. C. Secor, I have found it almost invariably caused by the essential oils, especially oil of wintergreen, used in the tooth powder or paste. Change tooth powder, or better still, in such cases, have patient get precipitated chalk, to which may be added a little pulverized borax. Pastes containing chlorate of potash, an oxidizing agent, will discolor amalgam fillings and gold work of less than 24 karat.—*F. L. Dundan, Dental Digest.*

**QUESTION.**—Please let me know the practical uses of ultra-violet rays in a dental office.—*Dr. P. A. Morell.*

**ANSWER.**—The ultra-violet ray machine is useful in a dental office as an aid in determining the vitality of teeth, and as a stimulator of normal cell activity in acute toothache, alveolar abscess, or after extraction pain. Iodex rubbed into the skin over affected part and burnished in with the broad violet ray applicator will usually hasten relief.—*V. C. S.*

## Obituary

CHARLES H. WALDRON, L.D.S., D.D.S., M.A.

**D**IED at the home of his son, Dr. Carl W. Waldron, 2121 Penn Ave. So., Minneapolis, April 15, 1921, Charles Henry Waldron, B.A., M.A., L.D.S. He was born in Murray Township, Ontario, Canada, December 20, 1854, the only son of James T. and Martha S. Waldron. Removing with his parents in 1855 to New York State, he grew up and received his primary and preparatory education at Fairport, N.Y. Two years of academic studies were spent at the University of Rochester. He completed his University work at Victoria University, Cobourg, Ontario, Canada, from which institution he was graduated in 1882 with the degree of B.A., with first-class honors and a medal in science. He was granted the degree of M.A. in 1884. Following his graduation he devoted his time to teaching in high schools and other educational institutions until an increasing impairment of hearing necessitated a change of endeavor.

He then took up the study of dentistry at the Royal College of Dental Surgeons, Toronto, graduating from that institution in 1892. Immediately after graduation he commenced the practice of dentistry on Spadina Ave., Toronto, in which community he labored faithfully for twenty-seven years, until forced to retire in December, 1919, on account of ill health.

Dr. Waldron was a keen student of dentistry, and his interest in the development and advances of his chosen profession never lagged. His was a familiar figure at all meetings of the Toronto and Ontario Dental Societies, of which he was an active member. He was a Mason, and a member of the Ancient Order of United Workmen, the Royal Templars of Temperance, and the Canadian Order of Woodmen of the World. He was very active in Woodmen affairs until forced to retire by illness. Dr. Waldron was a member of Trinity Methodist Church, Toronto.

He was a man of broad scholarship and highest Christian integrity, and possessed a personality that won him many friends. His long-standing affliction, deafness, cut him off from many activities for which he was otherwise so well fitted. His sunny disposition and character won him the admiration and love of those with whom he came in contact.

He was spared to enjoy fifteen months of well-earned leisure, the last eleven months with his wife and son in Minneapolis. His disability fortunately did not confine him until one week before his death, nor did it change his happy disposition, and he spent many happy hours among the delightful scenic beauties of Minneapolis and vicinity.

In 1882 he married Miss Harriet Annie Bowles, of Brighton, Ontario, who, with his son, survives him. His remains were interred in the Lakewood Cemetery, Minneapolis, Minnesota, April 18, 1921.

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, JULY, 1921

No. 7

## EDITORIAL

### The Need for More Uniform Dental Legislation

DATING almost from the period of Confederation, when each Province of the Dominion of Canada was given control of its own educational affairs, these Provinces have, one by one, passed their own Dental laws regulating the practice of Dentistry within their own boundaries. Year by year these Dentistry Acts have been revised or amended as each Legislature has deemed expedient or necessary, according to local demands.

As a consequence, we have to-day within the Dominion as many Dentistry Acts as there are Provinces, each one differing from the others even in many of the essentials pertaining to the conduct of the Profession. It must be apparent to the thoughtful mind that such isolated Provincial action is not conducive to either Canadian unity or professional strength. The practice of Dentistry is, in all essentials, the same the Dominion over. A Dentist in Nova Scotia practises his profession according to the same rules and with the same ethical ideals as the Dentist in Ontario or Manitoba or British Columbia. Why, then, should not the same principle of uniformity be striven for in the Dentistry Acts of these Provinces?

An important forward step in this matter was taken recently by the Canadian Dental Association, in the appointment of a Legislative Committee whose duties would be to act as an advisory council



in all matters pertaining to Provincial Dental Legislation. In practice it would work out in this way: this committee would endeavor to get in touch with the leaders of the Profession in any Province where new or amended Dental Legislation was being proposed, and endeavor step by step to establish, as far as workable, a Dominion standard for Dental Legislation. Also, such an outside body looking impartially at any proposed Dental Legislation ought to be able to render valuable assistance and frequently prevent short-sighted and injurious legislation.

While it will always be true that each Provincial Dental Act will in many of its details be moulded according to the special needs of that particular Province, yet a greater uniformity might and ought to prevail in at least the basic principles of these Acts.

What we would endeavor to emphasize is that in the future conduct of our Profession we should break the Provincial barriers that have held too long, and aim at a Dominion wide standard that will prove an impetus to the Profession from the Atlantic to the Pacific.

The Dominion Dental Council has rendered outstanding service in this direction. As the Dental Laws of each province become standardized, the way will be opened, through such a body as the Dominion Dental Council, to put the idea of a Dominion wide dental standard into actual operation.

---

### Four Prizes Open to Members of the Ontario Dental Association

---

**F**OUR prizes open to members of the Ontario Dental Association for the best answers to the following two questions:

What did one hour of chair service to a patient cost me in 1920, exclusive of cost of materials?

How do I know?

Prize for the best answer.....	\$50.00
Prize for the second best answer .....	25.00
Prize for the third best answer .....	15.00
Prize for the fourth best answer .....	10.00

Answers must be written out and mailed to Dr. George Wood Clapp, 220 West 42nd Street, New York, so as to reach him by July 1, 1921. The money for the prizes is held by the secretary of the Ontario Dental Association and will be awarded at Dr. Clapp's direction. The winning answers will be published in The Dental Digest and Oral Health.

---

### Practice For Sale

Dr. Norman Liberty, 603 Royal Bank Building, Toronto, owing to illness, has decided to dispose of his dental practice.



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, AUGUST, 1921

No. 8

## The Rupert Hall Method for Entire Upper and Lower Dentures\*\*

COMPILED FROM NOTES OF THE MEMBERS OF THE HAMILTON  
CLINIC CLUB\* H. A. SEMPLE, W. G. TRELFORD, AND  
OTHERS. EDITED BY W. E. CUMMER, AND REVISED  
BY DR. HALL HIMSELF.

### SUMMARY.

#### *Preliminary.*

1. Scope of the system.
2. Definitions.
3. Forces which tend to displace and dislodge full upper and lower dentures.
4. Forces which retain full upper and lower dentures.
5. Adhesion and cohesion: partial vacuum and atmospheric pressure.
6. Capillary force.
7. The scheme of utilization of these forces in full denture design.
8. The tidal vacuum.

#### *Examination of the Case.*

9. Local examination of the edentulous mouth.
10. Classification of cases.
11. Class 1—cases of greater difficulty.
12. Class 2—cases of lesser difficulty.

#### *Taking the Impression—(Cadillac)*

13. Impression trays—their choice and adaptation.
14. The Hall Impression Tray Compound.

\*The undersigned would like to express his very great indebtedness to the Hamilton Clinic Club, through the kindness and hospitality of which a large part of this material has been available.—W. E. C.

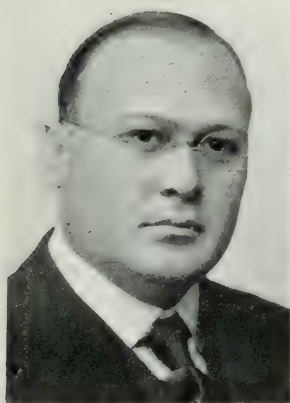
\*\*Bulletin No. 2, Canadian Dental Research Foundation.

15. Preparation of Hall's Impression Tray Compound.
16. Application of material to upper tray.
17. Insertion and first impression—upper.
18. Object of manipulation of margin of impression.
19. Technic of massaging and muscle-trimming at this stage, which approximately forms the periphery of the impression.
20. Removal of first impression from Britannia-metal impression tray, final massage and muscle-trim.
21. Repair of minor breakages at this stage.
22. Trimming compound at beginning of "muscle-trim" at anterior frenum.
23. The final muscle-trim of the buccal and labial parts of impression.
24. Tests for finished muscle-trim impression.
25. The operation of post-damming.
26. Relieving the centre of the impression.
27. Physical basis of the strong retention secured at this stage, and the reason for the impossibility of such as a finished impression.
28. The final correction with plaster, and its function.
29. The special qualities of the lining mix for the Hall impression.
30. Preparing the plaster for the lining mix.
31. Insertion of the plaster in impression tray.
32. Insertion and time of impression.
33. Removal of impression.
34. Preventing inaccuracies at this stage, due to expansion of plaster.
35. The Hall collodion-ether separating medium.
36. Boxing the impression.
37. Preparation for pouring the cast.
38. Stones, their use and hydration.
39. Mechanical vibrators for introducing stone into impression.
40. Removal of impression and "boxing" from cast.
41. Brief summary of steps, Hall "Cadillac" impression.
42. The Hall "Pierce Arrow" impression.
43. Indication for the "Pierce Arrow" impression.
44. Making the special vulcanite tray.
45. Tracing on compound for peripheral valve seal.
46. The pressure of application of peripheral valve seal for this impression.
47. Removal, holing, and trimming off excess.
48. Balance of the impression.
49. Brief summary of steps, Hall "Pierce Arrow" impression.
50. Hall "Ford" impression.

51. Securing the first impression and its preparation for the lining mix.
52. Completing the impression.
53. Brief summary of steps, Hall "Ford" impression.
54. Hall lower impression.
55. The retention of full lower denture.
56. Examination of the lower mouth.
57. Fitting to tray.
58. Applying the material to tray and insertion.
59. Insertion, check impression and impression.
60. Massage of margin at this stage.
61. Trimming and preparing for manipulation on periphery.
62. Muscle trim labial and buccal border.
63. Muscle trim for masseter muscle.
64. Muscle trim lingual anterior half of lower impression.
65. Muscle trim posterior half of lower impression.
66. Correction and relief at mylo-hyoid ridge.
67. Preparation of lining mix, insertion and removal.
68. Applying collodion, boxing, filling, and separating.

*N.B.—This article is intended to cover impression work only. It is hoped that in the near future the balance of the method will be compiled.*

#### PRELIMINARY.



**E**DENTULOUS humanity has received from the dental profession through her sons many great contributions which pile up the sum total of knowledge and skill available for the relief of this particular distress; and none are more worthy of a high place by reason of simplicity, well within the range of the average dentist, and almost uniformly happy and frequently amazing results, than that system that Dr. Rupert E. Hall has built, it is true, upon the life work of others who preceded him, but endowed with such a proportion of the fruits of individual labor, observation and research,

well tempered with a plus amount of plain so-called "horse sense," as to well deserve the name of the Hall system.

#### 1. SCOPE OF THE SYSTEM.

The entire process of full denture making as propounded by Dr. Hall bears the mark of his individuality, and includes: (a) impression making using in a special manner special materials original with

him,—the impression includes vault ridges, etc., also the peripheral tissues buccally and labially; (b) anatomical articulation, including an original articulator; (c) the development of “art which conceals art” in choice and arrangement of teeth and in the carving of wax and vulcanite; (d) the entire theory and practice of making rigid and accurate vulcanite dentures from these, also including a special flask with a screw piston packing device.

## 2. DEFINITIONS.

The peculiar needs of Dr. Hall's system indicate a more or less special nomenclature, including some new, also some old, terms. Quoting Dr. Hall in a reprint for the students of the Chicago College of Dental Surgeons, and by his courtesy for the students of the Royal College of Dental Surgeons:

*The Term Jaw.* Jaw may be defined as meaning all surface tissue of the jaw ridge, and in case of the upper the hard palate, upon or about which the base of an artificial denture is adapted and indirectly supported or retained excepting then, the attached flexible peripheral tissues. These may be more specifically described as all tissues, the fixed or rest positions of which are not modified by muscular action.

*Flexible Peripheral Tissue.* Flexible peripheral tissue may be defined as meaning all tissues attached to the jaw that are moved or are movable by the action of the muscles, including the soft palate.

*Base.* Base may be defined as meaning that part of a surface of an artificial denture that is adapted to and covers that jaw.

*Periphery.* Periphery may be defined as meaning that part of the border of an artificial denture adjacent to or continuous with the base that is adapted to and covers the flexible peripheral tissues.

*Interposed Saliva.* Interposed saliva may be defined as meaning the saliva interposed between the denture and the adapted tissue, held by capillary force.

*Adaptation.* Adaptation may be defined as meaning degrees of conformity and closeness of apposition of the outline and the surface of the base and periphery of an artificial denture with that of the jaw and flexible peripheral tissues to establish such a relationship as will bring their surfaces within the required distance or proximity to each other and make active the adhesive and cohesive of the interposed saliva between and through the complete surface of the jaw, flexible peripheral tissues, base and periphery of the denture.

*Basal Seat.* Basal seat may be defined as meaning the relation which the base of the denture bears to that of the indirectly supporting or retaining jaw in a state of adaptation. The jaw does not support or retain the base directly but indirectly through the medium of



interposed adhering saliva, the actual seat of the denture being formed and made up by and of the film of the interposing saliva upon or about which, through its adhesive and cohesive forces, the structure is supported or retained.

*Peripheral Valve Seal.* Peripheral valve seal may be defined as meaning a sufficiently light adaptation between the periphery of the denture and the flexible peripheral tissues to only affect valve action and prevent the ingress of air beneath the base of the denture in case of displacement, which breaks up capillary attraction and consequently adhesion. Too tight an adaptation interferes with circulation, resulting in shrinkage of tissue and loss of fit.

*Retention.* Retention may be defined as meaning resistance of the restoration to displacement and dislodgment.

*Displacement.* Displacement may be defined as meaning any change in relation of the base with that of its basal seat.

*Dislodgment.* Dislodgment may be defined as meaning breaking of the seal of the peripheral valve.

### 3. FORCES WHICH TEND TO DISPLACE AND DISLODGE FULL UPPER AND LOWER DENTURES.

These may be listed for the upper denture as follows:—

- (a) The articulation of the opposing teeth, including incision and mastication, in dentures not built on the principle of anatomical articulation or which interfere in side or protrusive movements, with unevenly distributed or dislodging pressure on dentures. In properly articulated dentures, incising and masticating movements, generally speaking, tend to seat the dentures more firmly.
- (b) The presence of unmasticated food, especially in dentures where no provision is made for unmasticated food. In Dr. Hall's system of anatomical articulation provision is made for the care of unmasticated food.
- (c) Contracting muscles, if these interfere with the borders of the denture, which are too long.
- (d) Teeth placed outside the ridge.
- (e) Gravity.
- (f) Any or all of above.

For the lower denture:—

- (a) The articulation of the opposing teeth, including incision and mastication.
- (b) The action of the tongue, especially if the lingual borders of the denture are too long.
- (c) The action of the contiguous muscles, if the labial and buccal borders are too long.

- (d) Teeth outside ridge as above.
- (e) Unmasticated food, as above.
- (f) Any or all of above.

#### 4. FORCES WHICH RETAIN FULL UPPER AND FULL LOWER DENTURES IN POSITION.

These forces in the upper are adhesion and cohesion; partial vacuum and atmospheric pressure. Capillary force is also operative retaining the interposed film of saliva in place.

In the lower these same forces are operative in a lesser degree, assisted somewhat by gravity.

#### 5. ADHESION AND COHESION; PARTIAL VACUUM AND ATMOSPHERIC PRESSURE.

These are commented upon by Dr. Hall as below:—

Adhesion means the force exerted by the attraction of unlike molecules for one another.

Cohesion means the force exerted by the attraction of like molecules for one another.

Vacuum means confined space devoid of matter.

Partial vacuum means confined space with degrees of emptiness.

Atmospheric pressure means the force exerted by the weight of the atmosphere which envelops the earth, the weight of which, at sea level, exerts a pressure of 14.7 lbs. pressure to the square inch.

The physical forces retaining an artificial denture in the absence of valve seal are adhesion and cohesion. The physical forces retaining an artificial denture with valve seal are adhesion, cohesion and atmospheric pressure, the force of the atmosphere being potential (inactive), which at the point of displacement becomes kinetic (active).

Adhesion in this particular is the aggregate molecular attraction exerted by the molecules of the interposing saliva for those of the substance of the structure of the base of the denture and those of the adapted tissues.

Cohesion is the aggregate molecular attraction of the molecules of the interposed saliva for each other in value as the surface and conformity of the base and hugs the adapted tissues and the amount of interposed saliva is minimized.

Atmospheric pressure, contrary to the opinion of many, is not a kinetic force acting conjointly with adhesion and cohesion in the position of the basal seat. The space between the denture and adapted tissue is completely filled with aerated saliva equalizing the pressure within the space with that of the atmosphere without the space. Were the maximum pressure of the air by complete removal of the interposed saliva and evacuation of the space thus formed, we

could then have the maximum pressure of the air 14.7 lbs. pressure to the square inch of base and peripheral surfaces covering the tissues retaining the denture as a kinetic force. But could the maximum pressure of the air be utilized through such source the human tissues will not tolerate permanently even a partial vacuum of an appreciable degree. We see this commonly demonstrated in the air chamber used to aid retention of upper dentures by this means. Hypertrophy of the tissues occurs, and the cavity fills. Thus do we conclusively show that atmospheric pressure cannot be utilized as a constant force to retain artificial dentures, owing to the fact that the interposed film of aerated equalized saliva between the denture and the adapted tissues cannot be dispensed with, and nature will not tolerate the negative pressure of vacuation about her tissues to make manifest such pressure by means of vacuum chambers. Therefore it must be considered that we have no degree of vacuation existing between the denture and the adapted tissues, consequently no possible aid from atmospheric pressure retaining the denture in the position of the basal seat, but it is supported or retained in proximity with the adapted tissues by the attraction of the molecules of the interposed liquid for those of the denture.

Since we know the relation or state defined as adaptation not to exist when an artificial denture first is introduced into the mouth, and until adaptation evolves by wearing the denture, permitting the tissues, as they do, to fill in and shape themselves to conformity and apposition with the surface of the base, we know also that during this introductory period, so to speak, while the tissues are adjusting themselves establishing adaptation, partially evacuated space exists between the denture and that atmospheric pressure is an aiding force retaining a denture conjointly with cohesion and adhesion. Also does it solve in part the perplexing puzzle of why many dentures lose their fit-so-called? Nature responds to the negative pressure of evacuation, the tissues fill in and obliterate the spaces and the force of the atmosphere becomes nil, and the denture is retained by adhesion and cohesion only, partly explains this, but more often faulty technic on the part of the dentist, by too tight a peripheral valve seal, with interference to circulation and "strangulation," loss of bulk tissue, and loosening of denture.

## 6. CAPILLARY FORCE.

Capillary force is that force that retains a thin film of liquid between two closely approximated surfaces. In the case of a full artificial denture, should the capillary film of interposed saliva become broken and replaced with air, adhesion is immediately destroyed. Capillary force is protected in denture design by special care to secure an accurate contact around that entire periphery of

the denture called peripheral valve seal, the word valve being used originally by Dr. Green to indicate *just sufficient* pressure to prevent leakage of air into the capillary film of saliva during a dislodging. The most favourable form of periphery is secured by an impression which registers slight pressure of the tissues overlapping the periphery while these tissues are at rest, and not interfering with muscle action, save in the distal part of the upper in which the tissues do not fold over the edge of the denture, in which case the most favorable form is a tapering edge rounded off sufficiently not to cut the soft tissues, also set at a position of slight pressure.

A most excellent chapter upon the question of atmospheric pressure as it relates to denture retention is that contained in Wilson's Dental Prosthetics, by George H. Wilson, and is earnestly commended for careful reading and study.

Since the retaining force offered for resistance to displacement by adhesion and cohesion alone is low in comparison with that required to resist the displacing forces of efficient incision and mastication, displacement of the denture easily and readily occurs.

How then may aid by utilization of the force of atmospheric pressure be accomplished for retention of an artificial denture for the sufficient incision and mastication of food?

Aid by means of the force of the atmosphere may be indirectly accomplished by the formation of an emergency partial vacuum arising momentarily and simultaneously with the displacement of the denture by the force of incision and mastication or by any other forces causing the displacement of the structure, hence:—

#### 7. THE SCHEME OF THE UTILIZATION OF THESE RETAINING FORCES AND THE AVOIDING OF DISLODGING AND DISPLACING FORCES IN DENTURE DESIGNS.

Quoting Dr. Hall further:—The requirements of denture design for the accomplishment of the emergency partial vacuum are that the base of the denture should cover and be adapted to the entire surface of the jaw, and have added to it a periphery with the border surface continuous with that of the base of the denture, and that the surface of such border be extended upon and lightly adapted to the flexible peripheral tissues, protecting capillary force, so that there is created a valve-like action between the flexible peripheral tissues and the surface of the periphery, to preclude therewith the ingress of air under the base of the denture and resist or prevent dislodgment of the same, through the indirectly applied resisting force of the atmosphere should displacement occur.

Preventing the ingress of air between the surface of the base of the denture and the tissues of the jaw at the time of displacement of the restoration, sealing the space occurring between the base and the



jaw without admitting the air, forms simultaneously with displacement a partial vacuum in which capillary force is partially destroyed.

#### 8. THE "TIDAL" VACUUM.

*The tidal or momentary partial vacuum created between the base of the denture and the adapted tissues of the jaw is therefore manifested only when the resistive forces of the cohesion of the molecules of the interposed saliva are overcome and partial displacement of the denture occurs.* Since the resultant atmospheric pressure is the direct force resisting dislodgment of the denture when forces displace the structure, forming a retentive partial vacuum, it is obvious that any force that creates and increases the space, degrees of vacuity and resultant atmospheric pressure, increases simultaneously resistance of the denture to dislodgment. The degree of vacuity of space is in direct ratio to the volume of the vacuum, owing to the fact that the sealed periphery precludes the ingress of air and the increasing space between the base and the jaw still accommodates the same quantity of air. Boyle's law governing the relationship between the pressure and volume of gases under a constant temperature covers this point, and is as follows:—"Pressure of a given mass of gas varies inversely as the volume of the space within which it is confined." That is, if the volume of a space existing under the denture consists of 1 c.c. at a pressure of one atmosphere, when increased to two c.c. of volume the pressure according to this law would be one half of an atmosphere. Therefore:—extent of adapted surface tissues, then, determines the relative of the respective forces exerted by adhesion and cohesion.

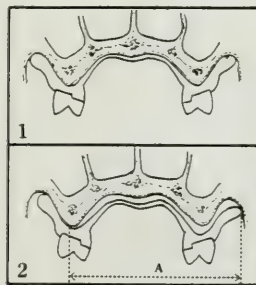


Fig. 1.—Tidal or emergency vacuum. In No. 1 the denture is shown in cross-section as in place, held by adhesion alone and the pressure not active. In No. 2 the same denture is shown in a displaced position. If the peripheral valve seal holds say between distance, so there is a pressure per square inch between these points, depending on the degree of ramification in empty space beneath denture.

Peripheral construction and adaptation for a seal and valve-like action with the flexible peripheral tissues, sealing space occurring

\*The retention between two surfaces with a capillary film of liquid between is not lessened in any degree by a vacuum.

between the base and jaw created by displacement of the denture, preventing the ingress of air, forming a relatively increasing partial vacuum indirectly applying the force of the atmosphere thereby, aids in preventing or oppose dislodgment of the artificial denture should displacement occur.

Credit for the construction and establishing such design and relations between the base, periphery, jaw and flexible peripheral tissues, should, in so far as we are informed, be given Dr. W. V. B. Ames, of Chicago, for he it was who first conceived of their importance in 1885 (Independent Practitioner, July), demonstrated their principles; others notable in early appreciation and use of their principles were the Greene Bros. of Missouri.

#### EXAMINATION OF THE CASE.

##### 9. LOCAL EXAMINATION OF THE EDENTULOUS MOUTH.

In the examination of the mouth for any definite object a definite sequence is of value. Here below are items as listed for a physical examination of the edentulous mouth as taken from an admirable work, a classification by Dr. M. W. House, of Indianapolis. (Pre-supposing the general examination has been already done and all oral conditions made healthy.)

##### *(a) Tone and development of the muscles of mastication and expression.*

1. A case in which degenerative changes have not occurred.
2. A case where approximately normal functions have been preserved by the wearing of artificial dentures.
3. A case in which a subnormal condition has resulted from the absence of natural or artificial dentures, or from the wearing of inefficient artificial dentures.

(This assists in a prognosis as to masticating efficiency.)

##### *(b) Bony Structure.*

##### *Physical size.*

1. Large upper or lower, affording the greatest possible advantages for stabilizing the dentures.
2. Medium size, affording less advantage for stabilizing the dentures.
3. Small size, presenting much difficulty in stabilizing the dentures and affording much less efficient service.

(Note)—Any mouth may present one class upper and another class lower. Note also anterior and posterior foramina.

##### *Arch form.*

1. Square type.

2. Tapering type.

3. Ovoid type.

(Note)—Any mouth may have one class upper and another class lower arch form.

*Physical form of alveolar ridges.*

1. With contours favorable to the aesthetic and efficient adaptation of dentures.

2. With contours presenting minor difficulties of the aesthetic and efficient adaptation of dentures.

3. With contours which demand surgical interference to permit of aesthetic and efficient adaptation of dentures.

(The above assist in a prognosis as to masticating efficiency and appearance.)

*Soft tissues.*

1. Normal uniform density of investing membrane of 1 mm. or 2 mm. thickness over the area to be covered by dentures.

2a Hypertrophied tissue conditions resulting in thickened investing membrane which may be efficiently controlled by proper denture form.

2b Entire investing membrane very thin and easily irritated; may be controlled by proper denture form.

3. Hypertrophied tissue conditions resulting in excessive thickening of investing membrane which necessitates surgical interference.

(The above is concerned with the ability of the tissues to carry strain, and the necessity or no for compensation hard or soft areas.)

*(c) Border tissue attachments.*

*Upper (Ocular or digital examination).*

1. High.

2. Medium.

3. Low.

*Lower.*

1. Low.

2. Medium.

3. High.

*(d) Muscular attachments.*

*Upper.*

1. High.

2. Medium.

3. Low.

*Lower.*

1. Low.





Class No. 2. In Class No. 1, cases of unusual difficulty, Dr. Hall's most elaborate and probably most effective impression technic is used, which he affectionately, after a well-known automobile, dubs "Pierce Arrow" impression technic, consuming two separate sittings of probably a half or three quarters of an hour each, with a special vulcanite tray. For Class No. 2 cases, of moderate difficulty, the impression technic so-called "Cadillac," consuming probably half to three quarters of an hour, is used; and for Class No. 1 cases, those of least difficulty, a simple impression in two operations, consuming approximately fifteen minutes, named after the proletarian

#### 11. CLASS 1—CASES OF GREATER DIFFICULTY.

Cases where the ridge is not prominent and the hard palate is flat, muscle attachments are low, thus making retention of denture difficult, are included. In making restorations of this kind it is necessary to make retention by making denture high around the peripheral border, and by "post-damming" the soft palate. Denture will fit tightly at first, but may become loose as the peripheral border pushes the tissues. Doctor Hall, indeed, occasionally uses this method in cases of unusual difficulty in which the soft tissue attachments approach the crest of the ridge, for the express purpose of pushing them permanently back, virtually developing a ridge. In such cases the impression is made, the plate worn till it loosens, and a new impression is made using the same plate as an impression tray, but with somewhat higher peripheral border "traced on," subsequently converted to vulcanite (rebased). This process is repeated until sufficient ridge is developed, the final plate carrying the usual peripheral valve seal.

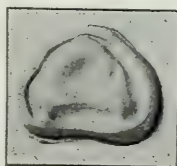


Fig. 3.—Model of case in which ridge has been practically developed by a series of "Pierce-Arrow" impressions, described later in these notes; treatment extending over thirteen months, with five complete dentures and three rebasings; an extreme case.

See Figure 3.—As stated above, the "Pierce Arrow," and, for Class I cases of more moderate difficulty, "Cadillac" technics are used for this type of case, depending upon difficulties.

#### 12. CLASS 2 OF LESSER DIFFICULTY.

Cases which may be called average cases, where a good ridge is available with a high palate and where "post-damming" is not

necessary, are included in this class. These cases will be in the majority in general practice, and the method used will be much quicker, consequently less expensive for patient,—the denture fitting well from the start and in most cases remaining so without further attention, and requiring the so-called "Ford" impression technic.

### TAKING THE IMPRESSION (CADILLAC).\*

#### 13. IMPRESSION TRAYS—CHOICE AND ADAPTATION.

An assortment of eight Britannia-metal trays or their equivalent is considered by Dr. Hall as adequate. They are as follows:

S. S. White, Upper Nos. 1, 2, 3.

S. S. White, Lower Nos. 1, 2, 3, 18 and 19.

Nos. 18 and 19 will be found to have a shaped lingual flange for lower mouths at the oblique ridge lingually.

\*Sections 13 to 40 describe the technic of the impression of middle difficulty, or rather for cases of middle difficulty. (See Section 10). Section 40 will describe the impression of greatest difficulty (Pierce Arrow) and the impression of least difficulty (Ford) using the above as a basis.

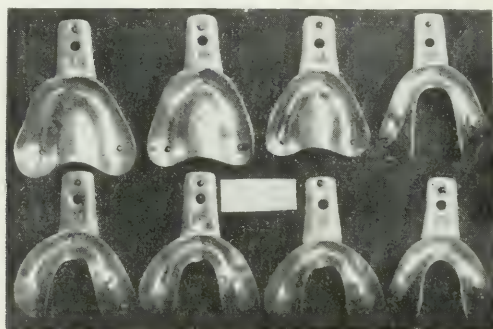


Fig. 4.—Trays Used for all Technic. Upper 1-2-3, Lower 1-2-3-18-19. These common forms, used with the Hall impression compound material, cover a wide range of cases.

But with regard for adaptation of these trays, the general principle should be followed, of allowing at least a quarter of an inch for the impression material itself; too close an adaptation of the tray is not necessary, as the excess is removed after the first impression, and the impression itself is thinned down as required.

#### 14. THE HALL IMPRESSION TRAY COMPOUND.

One of the primary reasons in the mind of Dr. Hall, in devising this material, is the necessity for a material sufficiently while cool that, after having been softened and pressed into place against the jaw in an impression tray, both the tray and the impression removed, the tray itself then separated from the compound, that the remainder consists of a special tray of hard material having the

accuracy of a special tray rapidly secured to which low heat ordinary modelling compound may be "traced on" or removed if necessary, and the whole, after suitable manipulation of muscle trimming, post damming, and similar, is filled with a very thin mix of plaster, and actually used as special impression tray.

#### 15. PREPARATION OF HALL'S IMPRESSION TRAY COMPOUND.

Either of the trays mentioned in Section 12 are prepared by ordinary methods of sterilization, and with a polished surface to facilitate ready separation of material. Sufficient of the material (about 2 cakes for an upper, and  $1\frac{1}{2}$  cakes for a lower) is dropped into an enamel pan of water heated to a temperature of  $180^{\circ}$  F., with blotting paper or similar in bottom of pan to prevent sticking. (This temperature checked, if desired, by a small chemical, confectioner's, or better still a Supplee thermometer fastened to the side of the enamel dish and reading at least  $212^{\circ}$  F.) Before the material is dropped into the water at  $180^{\circ}$  F., the pan should be removed from the heater, or vice-versa, thus preventing the sticking of the material to the bottom of the pan, also its deterioration. The cold material dropped into water at  $180^{\circ}$  F. absorbs sufficient heat in a few minutes to become raised in temperature to  $160^{\circ}$  F. (the water temperature also becoming reduced to  $160^{\circ}$  F.), which is a satisfactory working temperature for this material.

#### 16. APPLICATION OF MATERIAL TO IMPRESSION UPPER TRAY.

This may be done by raising the now plastic material from the bottom of the pan with a glass paddle (Supplee), metal paddle or similar, keeping fingers wet to prevent sticking. After rapidly rolling the material into the shape of a ball, the creases which occur are worked away from the surface by a process of revolving the ball of compound upon the two index fingers and sliding the thumbs both downward upon the ball of soft compound, pushing all the seams below, towards the index fingers, also completely softening any partly softened particles in the mass, at which time it is quickly placed on the tray with the thumb-smoothed part upwards, and with a sidewise movement of the thumbs quickly worked to place of a shape perhaps a little fuller in the centre, and heaped or pinched up a little at the sides.

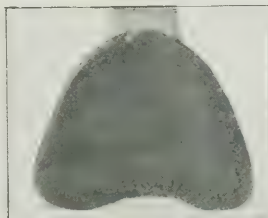


Fig. 4A.—Britannia-metal tray filled with Hall Impression-Tray Compound, ready for insertion in the mouth.—(Courtesy S. S. White Co.)



This having been accomplished, the material is then quickly passed over the flame, giving it a gloss, then quickly immersed in the water, to prevent burning of patient's mouth, now approximately at 140° F., at which time it is ready for insertion.

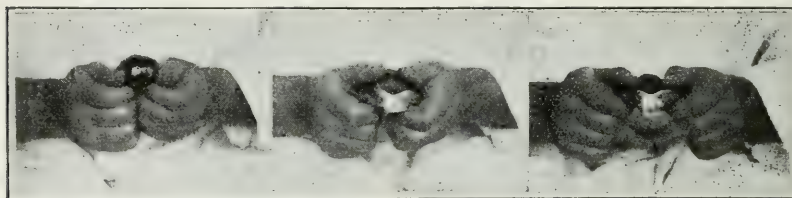


Fig. 5.—Applying Compound to Tray.

Step A.—Rolling material between thumb and first finger, rolling seams downward.

Step B.—Applying material to tray with seams against tray.

Step C.—Shaping material by pressing or wiping it outward against the flanges.

#### 17. INSERTION AND FIRST IMPRESSION, UPPER.

Having completed the mounting of the material on the tray, and the patient having been prepared with chin napkin, rinsing water, etc., in a fairly upright position in the chair, with the head on a level with the operator's elbow, the operator quickly takes his position, partly behind and partly to the right side of the patient, so that by stooping slightly his head will be directly over that of the patient. The right heel of the impression tray is insinuated between the patient's lips in the usual way, drawing the cheeks to the right, and allowing the left heel of the tray to slip into the mouth. Should the mouth be small, a mouth mirror may be necessary to assist the left heel of the tray into position. (See American Text Book, Prosthetic Dentistry, page 332.) Having inserted tray, the operator's head being kept directly above and sagittally in line with that of the patient (this is of great assistance in "centring" the tray and impression), the tray is then pressed quickly and gently upward until a shallow print of the crest of the alveolar ridge is secured. This is quickly removed, left heel first, in the usual way, and the centring checked up. If not correctly in the centre, the operation is repeated until the impression is correctly in centre, using the position of the handle of the tray directly under the patient's nose as a guide. The tray is then pressed up with an intermittent movement until it has reached a position in which any part of the tray is not closer than 3-16 of an inch from the tissues, with this distance as minimum thinness of impression; with massage movements, herein-after described, against the cheek, while the patient performs the act of protruding the tongue, for a definite object of carrying the distal excess in under the tray. The impression should extend about



an eighth of an inch back of the junction of the hard and soft palate. Note the tubercles at the back of impression indicating this, also movement of soft palate on patient pronouncing "ah."

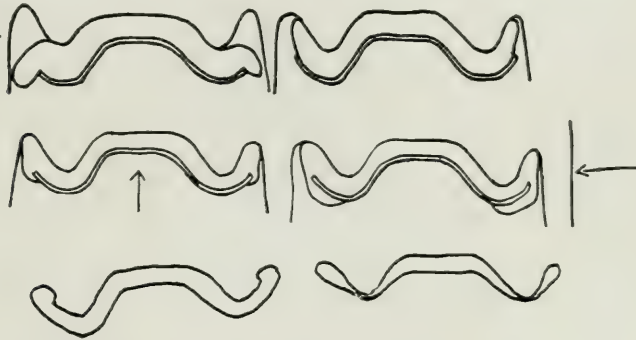


Fig. 6.—First Impression, Centering and Removal.

- (a) After removal, to check for centering.
- (b) In position before massage.
- (c) Massage partly begun.
- (d) Massage complete with excess pushed under tray.
- (e) Impression separated from tray, subsequently trimmed, and used as a special tray.
- (f) Impression tray pushed too far up:—result material too thin; must either be preferably discarded or reinforced.

## 18. OBJECT OF MANIPULATION OF MARGIN OF IMPRESSION.

An impression of the upper mouth which approaches the ideal is one which, while in *light* contact against the upper mouth, is in closest possible adaptation over the entire upper mouth, but at the extreme periphery and for a distance of approximately 1-8 of an inch inward, and also approximately 1-4 of an inch inward across the distal part of the denture between the maxillary tuberosities exerts slightly more pressure against the peripheral tissue, and also extends

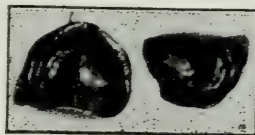


Fig. 7.—Impressions With and Without Massage and muscle-trimming. Note difference in detail which is in proportion to the uniform bearing upon the varying contours at the periphery.—(Courtesy Hamilton Clinic Club.)

slightly against these tissues, not, however, interfering with the muscles which act in this peripheral flexible tissue. See Section 2.

This has been defined as peripheral valve seal (see Section 2), and is essential in protecting the capillary film of saliva against ingress of air on tidal vacuum or retention during partial displace-

ment. The flexible peripheral tissues, including the soft palate, are set in motion during the various movements of the lips, cheeks, etc., as smiling, guarding the food during mastication, speech, etc., and it is considered by Dr. Hall that the movements of "sucking" and "swallowing" embrace all of these sufficiently well for the purpose of the impression.

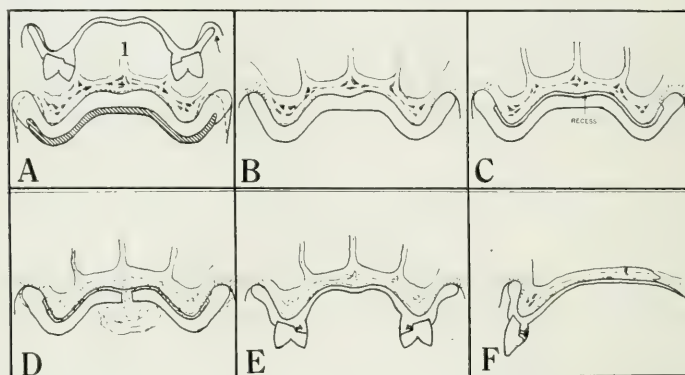


Fig. 8.—Peripheral Valve Seal, secured by manipulation in so-called "Cadillac" impression, for No. 2 Cases.

- (a) First stage with cheeks distended above a denture made from such an impression, no peripheral valve seal.
- (b) Second stage, with slight additional pressure at crest of periphery, only after massage and muscle-trim.
- (c) Third stage, after Kerr's Compound is placed on and pressed against the process at periphery.
- (d) Fourth stage, thin mix of plaster carried to place. Note hole for excess, also additional areas of pressure.
- (e) Finished denture made from above impression. Note areas of slightly additional pressure and contact only.
- (f) Antero-posterior view of same denture shown in (e). Note areas of additional pressure, especially 1-4 inch additional pressure at soft palate. (This is called "post-dam.")

Hence the action of massaging the cheeks lightly, and asking the patient to swallow and suck, approximately forms the entire margin of the impression to the shape of the peripheral valve tissue. At this stage, should the acts of sucking and swallowing be impossible for the patient to make, it may be omitted, to be resumed in the final trim should the patient be able to make them. In the upper this consists of a sharp cut in the anterior, varying in depth to accommodate the central frenum, high over the lateral and cuspids, with perhaps depression caused by fibres of the obicularis oris muscles, higher over the cuspids, often with a sharp depression for a buccal freedom immediately posterior, and varying and ascending contours caused by fibres of buccinator and masseter muscles until the maxillary tuberosity is reached; occasionally at this point the internal pterygoid muscle will impinge and press the soft impression material sharply away. Between the tuberosities the

form of the impression is shaped by the act of swallowing, the posterior tongue being in elevation and evenly pressing the material against the first one-eighth of an inch of the soft palate.



Fig. 9.—Position in Massaging Border of Impression. The pressure and direction of motion of the thumbs is important, and is indicated in Fig. 10.

#### 19. TECHNIC OF MASSAGING AND MUSCLE-TRIMMING PERIPHERY AT THIS STAGE, WHICH OPERATION APPROXIMATELY FORMS THE PERIPHERY OF THE IMPRESSION.

Some little skill and experience is required to judge the exact amount of pressure and its directions to secure the result indicated in Figure 9, with a periphery shaped to accommodate muscle action which occurs in sections of the periphery, and the rest position of the flexible soft tissues, which occurs in the balance of the periphery, and also to obtain the slight pressure necessary in Figure 5. While at this stage the results expected are only approximate, yet it is advisable at this stage to approach the finished results as closely as possible.

As soon as the impression has been centred and pressed to place, as described in the previous section, and has been carried upward to place, the dentist by now in a position immediately behind and above the patient, both middle fingers are slipped to the centre of gravity of the impression under the tray, after, and if possible while, the patient makes suck and swallow movements, the thumbs are rapidly applied to the patient's cheeks a little above the periphery of the impression, which may be distinctly felt underneath.

An effort has been made in Figure 10 to indicate something of the results to the periphery of the softened (and now cooling and hardening) compound during operation, and an effort has also been made in the same figure to indicate the sequence of events to the compound in contact with flexible peripheral tissues themselves.

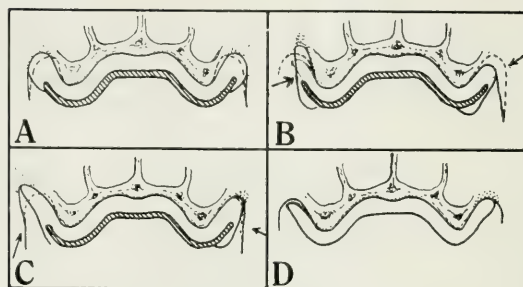


Fig. 10.—The Proper Application of Pressure in Thumb Massage of Upper Impression.

- (a) Before massage, peripheral flexible tissue, dotted line represents rest position of peripheral tissue. Note large distention of flexible peripheral tissue by excess of material at side of tray.
- (b) Pressure applied in a horizontal direction:—unless the pressure is extremely light the danger lies in pressing the material too far up, the rigid tray assisting in this, and with too much pressure upward in the finished plate, with irritation, and immediate loosening of plate where filed to relieve irritation. Dotted line indicates the rest position.
- (c) Pressure applied in too vertical an angle, with the result that the material is drawn down out of contact with the peripheral tissue. Dotted line indicates the rest position of the peripheral tissue.
- (d) Pressure and angle of pressure corrects, with the result that the periphery exerts a peripheral "valve seal." It is almost impossible to add further by way of explanation, except that the operator must "feel" the motion of the plastic compound through the thumbs, and through this feeling in mental vision of the position and the amount of pressure that it exerts upon the peripheral tissue.

An effort has been made in the same to indicate the sequence of events to the compound in contact with the flexible peripheral tissues themselves. In as few words as possible, the aim of the dentist is to cause such movements by massage and muscle-movement of the patient as to carry the impression material, at this stage, to a valve fit by slight extensions into the contours, at rest, and also as effected in sections by muscle action, and by actually mentally seeing and directing through the thumbs and fingers which cause the movement, the material to this position. It must also be remembered that, at this stage, the forming of these margins is only approximate, and is further corrected, as described below, by a repetition of these movements on the thinned and softened margins, with the tray removed.

## 20. REMOVAL OF FIRST IMPRESSION FROM BRITANNIA-METAL IMPRESSION TRAY, FINAL MASSAGE AND MUSCLE-TRIM.

The operation of removing the first impression from the tray is readily done by first trimming off the overhanging material, both buccally and distally with a *sharp* penknife, then by a smart tap with the back of the penknife on that part of the tray at which the handle joins the body, the tray is quickly separated without fracture from the first impression, which now becomes the special tray.



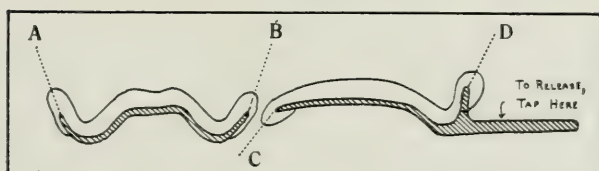


Fig. 11.—Trimming off overhang and releasing tray from the first impression, which impression now becomes the special tray, and which at a later stage is corrected with thin plaster. A-B-C-D line of division of overhang from body of impression, which is cut away, after which the impression may be separated from the tray by tapping the tray as indicated.

## 21. REPAIR OF MINOR BREAKAGES AT THIS STAGE.

Should, by any chance, a small fracture occur in separating the impression from the tray, a quick repair may be readily made by so-called "tracing-on," by which a fragment or a previously prepared stick of material is held in the flame until the molten portion is ready to drip off from the balance, quickly applied to the buccal or lingual side of the fracture by the right hand, the left hand holding the parts in a position similar to the making of a small repair. Repetition of this will also sufficiently reinforce the material where thin, and if necessary pieces of sheet metal, heated to about 160° F., may be dropped in this, thoroughly reinforcing the part. Metallic pieces must not be placed closer than one-half an inch from the periphery, thus avoiding an interference with future muscle-trimming.

## 22. TRIMMING COMPOUND AT THE BEGINNING OF "MUSCLE TRIM" AT ANTERIOR FRENUM.

Following the removal of the first impression from the tray, the

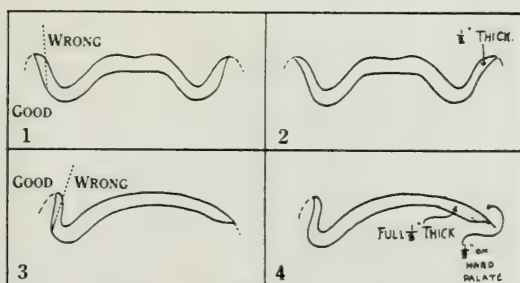


Fig. 12.—Trimming the Impression Immediately Prior to the Operation of "Muscle Trimming" (In Section 20 ).

- (1) First impression incorrectly trimmed, should be cut to crest of impression only.
- (2) Impression thinned down to one-eighth of an inch for half an inch, care must be taken not to cut centrally past the crest of the flange.
- (3) Side view of impression, after leaving metal tray, with wrong trim as in 1.
- (4) Trim for post damming one-eighth of an inch behind junction of hard and soft palate. This may be seen by asking the patient to open the mouth and say "ah" or by the so-called "Fovea Palatina" small depressions occurring slightly ahead of this.

first operation is to trim, with a sharp penknife, and a sharp Kingsley scraper, the margin of the impression to a thickness of about one-eighth of an inch, for the reason that, for the subsequent operation of muscle-trimming, which is the shaping of the heated and softened margins of the impression by muscle action produced by a suck and swallow (post-damming being the shaping of the distal part of the impression between the tuberosities, and muscle-trimming the shaping of the balance of the impression margins), the edge must be thin, otherwise the more or less delicate muscle action would not leave an imprint on the material.

Particular care should be taken not to remove any material past the crest of the flange of the impression, as the crest of the flange marks the semi-muscle-trimmed contour, subject to further shaping, as hereinafter described.

### 23. THE FINAL MUSCLE TRIM OF THE BUCCAL AND LABIAL PARTS OF THE IMPRESSION.

As may be noted in Section 17, the ultimate object of the manipulation of the impression is to place the periphery of the impression in valve contact with sufficient relief for muscle action.

At this stage these manipulations of warming the margin over a small flame and re-applying with gentle massage are repeated with probably less muscular effort on the part of the patient, and less massage pressure on the part of the dentists, on account of the thinner margin of the partly corrected impression. Should massage and muscle movement fail to turn back the softened edge, a deficiency of material must be assumed and more "traced on."

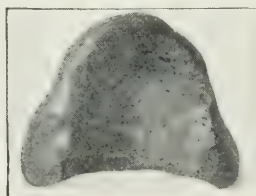


Fig. 13.—Thinning the lingual side of impression with a sharp knife and a sharp Kingsley scraper. The lingual bulk of the impression may be considerably reduced, adding much to the ease and facility with which it may be handled in the mouth during the subsequent operations.—(Courtesy S. S. White Company).

### 24. TESTS FOR FINISHED MUSCLE TRIM OPERATION.

It must again be pointed out that, at this stage, correction of the position of the now muscle-trimmed margin is largely a matter of judgment on the part of the operator, who, having in mind the

characteristics of a proper valve seal, as indicated in Figure , may raise the lip and observe whether or not the desired result is secured.

There are, however, other simple tests which may be used at this stage to test the corrections of the margin which may be as follows:

*Possible errors at this stage:*

- (a) Too close to the alveolar process.
- (b) Too far away from the alveolar process.
- (c) Too high up against the flexible peripheral tissues.
- (d) Too low or out of contact with the flexible peripheral tissues, especially at frenum or over maxillary tuberosities.
- (e) Any possible combination of the foregoing, treated below in the same order.

*Their corrections:*

- (a) Should the material be too close, the patient will feel discomfort, and a blanching may be noted on examination. To correct: reheat at this part, reinsert and re-massage.
- (b) Should the material stand out too far from the alveolar process, this will be distinctly noted by pressing slightly the margin with the index finger, as the margin will be felt to stand away from the process as a shelf. To remedy: re-heat and re-massage.
- (c) Should the material be too high up, a tendency may be noted to throw the impression down, or the cheeks or alae of the nose may seem to be slightly dislodged, and with finger on the cheek the subjacent tissue may seem crowded. This is the malposition most difficult of detection, and which requires the most experience and judgment, and it is quite possible for an experienced operator to be in error in this particular. Correction: re-heat and re-massage.
- (d) Margin too low. This may be detected by bubbles of saliva oozing out on the insertion of impression, and lack of adhesion also of impression. Remedy: trace on material, re-insert and re-massage until correct.

## 25. THE OPERATION OF POST-DAMMING.

Post-damming is practically "muscle-trimming," only in location, the distal part of the upper plate between the tuberosities, and is the operation of securing peripheral valve seal without interference with moving tissues between these two points. The increase of adhesion to an impression is often most startling, after post-damming has been done to an already correctly muscle-trimmed (buccally and labially) impression.

Should the impression not reach one-eighth of an inch past the hard palate and lap upon the soft palate, this distance, the black compound should be traced on until the entire impression not only reaches this length, but also amply covers the tuberosities.

This having been accomplished, the actual operation of post-damming begins, as indicated in Figure 14, which is the securing of a valve fit, or slightly additional pressure from one-eighth to a quarter of an inch on the soft palate. A stick of Kerr's Compound (red stick) is taken, and the material is "traced on" the palatal surface of the impression, the whole distal part passed once or twice through the flame to secure uniform plasticity of the Kerr's Compound, with minimum softening of the Hall's Compound below.

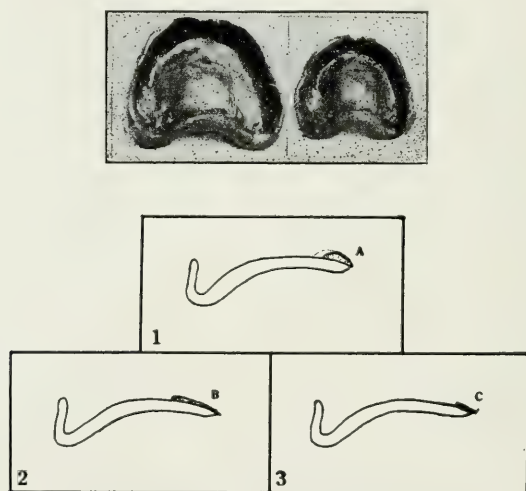


Fig. 14.—Stages of post-damming Hall impression.

- (1) Shows first step, soft Kerr's Compound stick is heated and traced upon the impression tray of Hall's black compound, which remains rigid, having a softening point of 20° above that of Kerr's Compound sticks.
- (2) After insertion in the mouth, with the patient swallowing; while the Kerr's Compound is still soft, the elevation of the tongue in the act of swallowing exerts uniform upward pressure upon the distal part of the impression, compressing the softened compound against the anterior soft palate, and if correctly done completes the valve fit against the peripheral tissue, with usually a marked adhesion, but with the valve contact too wide. The drawing of the wet finger gently across this a few times will prevent the material "sagging" out of contact.
- (3) With a Kingsley scraper the "post-dam" is trimmed from anterior towards posterior until the contact is from one-eighth to one-quarter of an inch on the soft palate,—the poorer the anterior ridge, the greater the contact necessary. This should not come in contact with the hard palate, as irritation and overload at this point would result.—(Courtesy Hamilton Clinic Club).

The distal half of the impression is then quickly dipped in warm water (approximately 160°), to prevent burning of the compound



just removed from the open flame, and quickly seated in the mouth of the patient, with instructions to swallow twice at least. If for any reason (for example, a softened anterior ridge) a little extra pressure on the soft palate is desired, the forefinger may be "wiped" across, giving the light pressure desired. This should, however, not often be done, for the reason of possible excess peripheral pressure with strangulation and consequent shrinkage of the entire jaw.

The patient should then be asked to make dislodging movements, and if a satisfactory adhesion is found the next step is proceeded with. If not, a lack of contact may be looked for and usually found by inserting the wet impression and slightly moving up and down, exhibiting air bubbles at the part which is at fault. Tracing on of material and heating at least a quarter of an inch on either side, with suitable massage, as already described, will in all probability correct this.

## 26. RELIEVING THE CENTRE OF THE IMPRESSION.

Here follows the operation of scraping out the entire centre or vault portion of the impression with a sharp Kingsley scraper, beginning from about one-eighth to one-quarter of an inch from the extreme periphery and relieving the entire centre to approximately the thickness of probably 18 gauge Brown and Sharpe, as indicated in Figure 15.

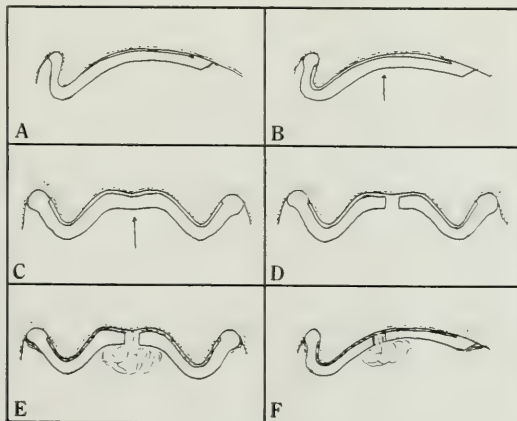


Fig. 15.—Relieving and Holding the Impression.

- (1) First impression immediately after completed post-damming.
- (2) Impression after entirely relieved, air space over entire centre. A denture made from such an impression would be retained by atmospheric pressure alone, and would not be practical because the extreme pressure would partly cut off the articulation as well as badly cut the tissues, and the central soft tissues would ultimately fill the partial vacuum.
- (3) Lateral section of No. 2.

- (4) The final operation to the first impression of "holing" or drilling a small hole, 1-8 of an inch or a trifle less, to allow the excess plaster in the final step to escape. Immediately after "holing" the impression loses its atmospheric pressure and is held by a small adhesion over a narrow periphery only, therefore loses practically all of its retention, which comes back considerably augmented after the final step of lining with plaster.
- (5) Addition of the final plaster,—this should secure the ideal conditions desired, i.e. accurate contact over the entire jaw, producing adhesion, and peripheral valve seal at periphery, which provides for the tidal vacuum.
- (6) Longitudinal section as in No. 5, at the line of contact of the muscle-trimmed and post-dammed periphery, the plaster must be so thin that the finished impression on removal should show this to (See Figure 21).

## 27. PHYSICAL BASIS OF THE STRONG RETENTION SECURED AT THIS SAGE, AND THE REASON FOR THE IMPOSSIBILITY OF SUCH IN A FINISHED IMPRESSION.

The next step of "holing" the impression as indicated in Fig. 12, an impression with central relief and contact at periphery only would be strongly retained should the patient make a strong exhaustive movement or "suck" in the mouth, in the mouth fifteen inches of a vacuum, corresponding roughly to seven and one-half pound pressure to the square inch, may be secured by many, and estimating the area as approximately four square inches in such a combination, and presupposing accurate adaptation at the periphery, an upward air pressure against the partial vacuum would total thirty pounds in the denture. This would not be practical, because this strong pressure would be concentrated on the soft periphery and would not only cut off the circulation, but would cause injury from such an overload, and as the ideal denture rests with even pressure upon the entire jaw with, as already described, peripheral valve seal, or slightly increased pressure at periphery, provisions must be made for the final step for this impression, namely, contact with the central jaw area. This is done by drilling a small hole of approximately nine gauge B. & S. in the centre of the impression, which allows the escape of air and excess of thin plaster in the next and final operation,—namely, the final correction with plaster, and which instantly relieves the atmospheric pressure and its strong retention.

## 28. THE FINAL CORRECTION WITH PLASTER, AND ITS FUNCTION.

To correct the condition described in the preceding section, and to secure the ideal condition of even contact over the entire jaw at slight additional pressure at the peripheral valve seal, a mix of the finest procurable plaster (Kerr's Snow White, for example), introduced at the consistency of thin cream, is added to the impression and the impression again returned to the mouth, with the excess passing through the hole previously drilled through the centre.

## 29. THE SPECIAL QUALITIES OF THE LINING MIX FOR THE HALL IMPRESSION.

Upon the judgment and skill of the dentist in the mixing and insertion at the psychological moment of this lining mix of plaster, depends the entire success or failure of the impression, for the lining mix as indicated in Fig. 21, must be of such a consistency that the peripheral valve seal should show through, leaving contact at light pressure of plaster upon the remainder of the jaw and "setting" in the mouth at about one and one half to two minutes, allowing time for adjustment, without fatigue to patient. This produces in its highest degree adhesion and cohesion by accurate contact, while the slight excess of pressure at the peripheral valve seal protects ingress of air during dislodging movements. (Section 30.)

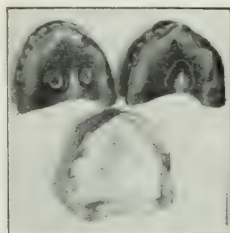


Fig. 16.—A Finished Hall "Pierce Arrow" Impression. Note the detail afforded by the properly mixed lining mix and the peripheral valve seal in Kerr's Compound, the former muscle-trim and post-dam showing through. Note difference in length beside previous unsuccessful restoration.—(Courtesy Hamilton Clinic Club.)

## 30. PREPARING THE PASTER FOR LINING MIX.

The plaster itself must be of first quality; as Dr. Hall has found that Kerr's Snow White Dental Plaster answers to the peculiar characteristics desired, the technic of preparing this as original with Dr. Hall, presupposes the exclusive use of the material.

Step (a) *Sieving the plaster.*

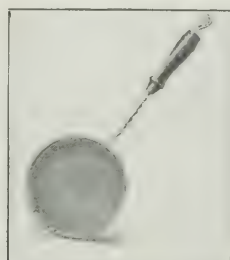


Fig. 17.—Dipper sieve for sifting plaster.—(Courtesy S. S. White Co.)

A dipper sieve or a rotary four sifter of approximately sixteen meshes to the inch is first used to catch any set particles or foreign material which may have accidentally become incorporated. This is done upon a sheet of paper, or into an extra dry plaster bowl.

(b) *The plaster bowl and water.*

A clean scrubbed bowl is necessary, of the largest size made (twenty-four ounces capacity). Into this is placed twenty-five c.c. of water, at such temperature as it leaves the hydrant, 50° to 60° F., depending on the conditions. Suitable spoons of cast aluminum may be procured from department stores or similar house-furnishing establishments, as originally suggested by Dr. George H. Wilson, holding 25 c.c. (See Fig. 18.)



Fig. 18.—Plaster Measuring Spoons of 25cc. Capacity.

- (a) Original spoon procurable in department stores, holding 25cc., as originally suggested by Dr. Wilson.  
 (b) Special design made from (a) by waxing heavier handle and having cast at a brass foundry and finished at a plater's.

Step (c) Ordinary sugar shaker of 3 ounces capacity with 19 holes to 6 inches in cover; this is for the purpose of holding sulphate of potash.

Step (d) The ordinary sugar shaker filled with sulphate of potash is next taken and two shakes of the sulphate into the 25 c.c. of water, alternated by a movement of tapping the bottom of the shaker on the bench is used. This will release approximately 10 grams (troy) of sulphate. A saturated solution of sulphate may also be used if desired. With a wide spatula this should be mulled against the bowl until the solution is complete.

Step (e) 25 c.c. by spoon measure of sifted plaster is next sifted into the water.

Step (f) *Stirring.* Some experience is necessary, as sometimes two or three minutes stirring are required before the "clabber" condition of the plaster desired appears. The bowl is rotated by the left hand and inclined to permit closer observation, and the spatula is moved back and forth sideways in



a cutting movement as advised by Dr. Prothero. Immediately the slightest thickening of the plaster, from a milky fluid which one would surmise would never set, to a slight thickening, as cream curdling in milk, the plaster is poured into the waiting impression, previously dampened, and the impression is hurried to the mouth of the patient in the shortest possible time.

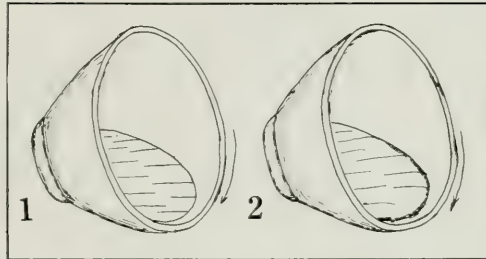


Fig. 19.—An attempt to diagrammatically illustrate the “clabber” of Kerr’s Snow White Plaster in Hall’s technic of lining mix.

- (1) Position of bowl when rotated with mix inside, with surfaces of milk-like consistency of plaster flat while bowl rotates.
- (2) When the milk-like plaster begins to thicken into a cream-like plaster, showing a beginning tendency to follow the rotating bowl. This is the psychological moment, and all speed is necessary to fill the impression and get it into position in the patient’s mouth.

### 31. INSERTION OF PLASTER IN IMPRESSION TRAY.

Probably the most important point to be borne in mind at this stage is that of the proper consistency of the lining mix of plaster at the time the impression reaches the mouth. Should the plaster be any harder than the incipient crystallization, as indicated in Figure 19.

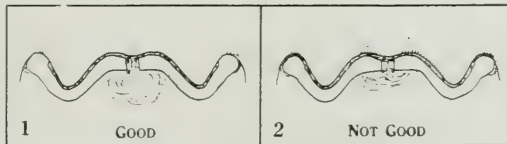


Fig. 20.—Error of inserting impression with plaster with crystallization too far advanced.

- (a) Impression with plaster lining too hard. The impression is held out from its place and the muscle-trim and post-dam, also relieve in centre of first impression entirely lost.
- (b) Impression with plaster lining too hard, but forced to place with considerable pressure, note the muscle trim periphery approaches somewhat more closely, but not sufficient, and the softer tissues are seriously displaced, rebounding against the impression with a dislodging movement, also against the denture made from such an impression. In both cases the plaster should be carefully washed or chipped out, and the plaster re-mixed and re-applied.

the muscle trim and post-dam is altogether lost and the tissue probably overstrained, and altogether lost and the plaster should be

washed or chipped out carefully, scrubbed to remove any vestage of plaster (the presence of already set plaster hastens the setting of a fresh mix) and the mix re-made and re-applied.

### 32. INSERTION AND TIME OF IMPRESSION.

The shortest possible time should elapse between the seating of the impression after it has been prepared with a soft plaster, with the head of the patient slightly tipped back the impression is passed between the lips with the posterior part reaching its seat a little ahead of the anterior part driving a larger portion of the excess plaster towards the mesial, the impression is gently carried to place with an intermittent pressure, which literally pumps the plaster to its place, and the excess through the hole or at the sides or back, should anything but the slightest resistance be encountered from the impression the impression should be removed, the plaster lining either washed or chipped out, and the process repeated.

As soon as the impression is "Home," which can easily be detected by its immovability, one or two light massage movements are made on the lips and cheeks to send excess downward, and pressure is immediately released and the fingers removed from the mouth. The patient is instructed to relax all mouth tissues and lean forward, allowing the saliva to accumulate in the anterior part of the mouth preventing choking, a little of the plaster in the bowl may be removed by the finger and placed upon the impression as a timer for removal, as the plaster in the impression, due to the heat of the tissues, sets more rapidly than that in the bowl, as soon as that plaster exhibits complete crystallization, which should not be longer than two or three minutes, the removal of the impression is then begun.

*(To be Concluded in Next Issue)*

---

EATING TO LIVE.—According to some authoritative writers whose opinions upon health and disease carry weight with the general public, the chief cause of dental disease and defective jaw development is a positively known and settled thing. Dr. Leonard Williams, in an article published last month in a London evening paper, states that the assumption that foods should be cooked, upon which modern theories of dietetics have been based, is entirely unwarranted. He stresses the vital and all-sufficient importance of eating raw foods, and concludes his article as follows: "If vitamine containing, that is, raw foods, are given in sufficient abundance, there will be little trouble with the modern diseases above-mentioned, and none with dental disease. The way to get rid of dental troubles in the young is to treat the children as we treat puppy-dogs, by giving them something they must chew, and make them, in fact, work for their living."—*Dental Digest*.

## Local Anaesthesia by Novocain

BY J. W. PARE, M.D.

IN no case in which I have used Novocain have I had the slightest anxiety about the condition of the patient; there has been no shock, fainting, perspiration, nor collapse, and the patients have felt no after ill-effects. Where possible, I advise the patients to take food before the extraction, because I think that after food they are in a condition better able to resist shock. From my experience, I am of opinion that where Novocain fails to anaesthetise a part, it is owing to imperfect application of the drug. When the gum is swollen from inflammatory exudation, it is most difficult to get the blanching and cheese-like consistency. The same difficulty may be experienced where the gum over the alveolus is unusually thin.

If the patient is neurotic, a swab containing a five per cent. solution of Novocain is put on the gum for five minutes, so as to render the latter insensitive to the insertion of the needle. One or two Novocain Suprarenin Tablets, each containing 1-3 grain of Novocain, are dissolved in 33 minims of hot water to make either a one or two per cent. solution respectively. If an upper tooth, for example, is to be extracted, the needle is inserted into the gum  $\frac{1}{8}$ -in. above the cervical margin, and a drop or two of the Novocain solution is forced in; I keep the needle in position a few seconds to allow the anaesthetic to act before forcing any more fluid into the tissue. After forcing in the solution, the needle should not be immediately removed, because if this is done, then, owing to the pressure being greater in the gum than outside, some of the fluid will escape. If the position selected is a good one (between the roots is better than over them), the gum will gradually blanch and become the consistency of cheese; the needle should then be removed and again inserted just inside the periphery of the blanching, and so on, till the whole of the gum on both sides of the tooth is anaesthetised. I do not hurry the injection, but take three to five minutes for the process. The tooth can then be extracted. I have so far never used more than three tablets (one grain Novocain) at one sitting.

In conclusion, I might summarise the advantages of Novocain as follows:

- 1.—It produces a perfect local anaesthesia.
- 2.—The duration of the anaesthesia is longer than that of cocaine.
- 3.—Even in strong solutions it does not irritate the tissues.
- 4.—It is at least equal to cocaine in anaesthetic power.
- 5.—It is many times less toxic than cocaine, in comparison with which it can be used in larger doses in perfect safety.
- 6.—It is very constant in its action.

- 7.—It does not produce shock, cardiac or respiratory failure, after-pain, nor sloughing of the gum.
  - 8.—It can be given immediately after food.
  - 9.—It is not a secret preparation, but a substance of known and definite chemical composition.
  - 10.—It is cheaper than most proprietary anaesthetic preparations.
- British Medical Journal.*

### Dominion Dental Council of Canada— Professional Examinations

*Commencing Tuesday, Sept. 13th, 1921.*

#### TIME TABLE.

TUESDAY	10 o'clock	Operative Dentistry (Clinical).
"	2 o'clock	Prosthetic Dentistry (Clinical).
WEDNESDAY	10 o'clock	Operative Dentistry.
"	2 o'clock	Prosthetic Dentistry & Metallurgy.
THURSDAY	10 o'clock	Anaesthetics.
"	2 o'clock	Materia Medica and Therapeutics.
FRIDAY	10 o'clock	Orthodontia.
"	2 o'clock	Medicine and Surgery.
SATURDAY	10 o'clock	Pathology and Bacteriology.
MONDAY	10 o'clock	Jurisprudence and Ethics.
"	2 o'clock	Physics and Chemistry.
TUESDAY	10 o'clock	Anatomy.
"	2 o'clock	Physiology and Histology.

### Dominion Dental Council Examinations June 1921

The following have passed in Operative Dentistry:

#### PRACTICAL.

Abar	Dobbs	Lumb
Adams, Harold	Dodds	Mills
Akins	Dunbar	Mitchell
Adams, R. B.	Dixon	Marshall
Barber	Elliott	MacKay
Barnes	Gabriel	Mackee
Barton	Granovsky	McCutcheon
Bertrand	Graham, C. C.	Olson
Best	Graham, F. M.	Porter
Butler	Gott	Robb
Cameron, A. A.	Hoar	Rogers
Crowe	Hunter	Smart
Coughlin	Joyce	Smith
Corbett	Johnston	Sockett
Daly	Kinsman	Steel
Derbyshire	Lawley	Sheridan
Dinniwell	Layton	Taylor



Teal  
Upton  
Wilson, C. B.

Whittaker  
Wessels  
Wilson, T. R.

Windrim  
White  
Zimmerman

The following have passed in Prosthetic Dentistry:

## PRACTICAL.

Abar  
Adams, Harold  
Akins  
Adams, R. D.  
Barber  
Barnes  
Barton  
Bertrand  
Best  
Cameron  
Crowe  
Coughlin  
Corbett  
Daly  
Derbyshire  
Dinniwell  
Dobbs  
Dodds  
Dunbar  
Dixon

Elliot  
Gabriel  
Granovsky  
Graham, C. C.  
Graham, F. M.  
Gott  
Hoar  
Hunter  
Joyce  
Johnston  
Kinsman  
Lawley  
Layton  
Lumb  
Mills  
Mitchell  
Marshall  
MacKay  
Mackee  
McCutcheon

Olson  
Porter  
Robb  
Rogers  
Smart  
Smith  
Sckett  
Steele  
Sheridan  
Taylor  
Teal  
Upton  
Wilson, C. B.  
Whittaker  
Wessels  
Wilson, P. R.  
Windrim  
White  
Zimmerman

The following have passed in Operative Dentistry:

## WRITTEN.

Abar  
Adams, Harold  
Aikins  
Barber  
Barnes  
Barton  
Bertrand  
Best  
Cameron  
Crowe  
Daly  
Derbyshire  
Dobbs  
Dodds

Dunbar  
Elliot  
Gabriel  
Granovsky  
Hoar  
Humber  
Joyce  
Kinsman  
Lawley  
Layton  
Lumb  
Mills  
Mitchell  
MacKay

McCutcheon  
Olson  
Porter  
Robb  
Rogers  
Smart  
Smith, G. R.  
Sckett  
Steele  
Taylor  
Upton  
Wilson, C. B.  
Zimmerman

The following have passed in Prosthetic Dentistry:

## WRITTEN.

Abar  
Adams, Harold  
Barber  
Barton  
Bertrand  
Best  
Cameron  
Crowe  
Daly  
Derbyshire  
Dobbs  
Dodds

Dunbar  
Elliot  
Gabriel  
Granovsky  
Humber  
Joyce  
Kinsman  
Lawley  
Layton  
Mills  
Mitchell  
MacKay

Olson  
Porter  
Robb  
Rogers  
Smith  
Steele  
Taylor  
Upton  
Wilson, C. B.  
Zimmerman

## The following have passed in Anaesthetics:

Abar	Dunbar	McCutcheon
Adams, Harold	Elliot	Olson
Aikins	Gabriel	Porter
Barber	Granovsky	Robb
Barnes	Hoar	Rogers
Barton	Humber	Smart
Bertrand	Joyce	Smith
Best	Kinsman	Steele
Cameron, A. A.	Lawley	Taylor
Crowe	Layton	Upton
Daly	Lumb	Wilson, C. B.
Derbyshire	Mills	Zimmerman
Dobbs	Mitchell	
Dodds	MacKay	

## The following have passed in Materia Medica and Therapeutics:

Barber	Heidgerken	MacKenzie, Annie S.
Bertrand	Hesson	Robb
Calbick	Joy	Rogers
Coupland	Joyce	Sharon
Dobbs	Kerr	Shragge
Dodds	Killins	Smith
Graham, J. E.	Lawley	Yoerger
Green	Murdock	

## The following have passed in Orthodontia:

Abar	Dunbar	MacKay
Adams, Harold	Elliot	McCutcheon
Aikins	Gabriel	Olson
Barber	Granovsky	Porter
Barnes	Hoar	Robb
Barton	Humber	Rogers
Bertrand	Joyce	Smart
Best	Kinsman	Steele
Cameron, A. A.	Lowley	Taylor
Crowe	Layton	Upton
Daly	Lumb	Wilson, C. B.
Derbyshire	Mills	Zimmerman
Dodds	Mitchell	

## The following have passed in Medicine and Surgery:

Adams, Harold	Hoar	Porter
Barber	Humber	Robb
Barnes	Joyce	Rogers
Barton	Kinsman	Smart
Best	Lawley	Smith
Cameron, A. A.	Lumb	Steele
Crowe	Mills	Taylor
Dodds	Mitchell	Upton
Dunbar	MacKay	Wilson, C. B.
Elliot	McCutcheon	Zimmerman
Gabriel	McVicar	
Granovsky	Olson	

## The following have passed in Pathology and Bacteriology:

Abar	Gabriel	Porter
Barber	Greene	Robb
Barton	Joyce	Rogers
Bertrand	Kinsman	Shragge
Cameron A. A.	Layton	Smith
Coupland	Mitchell	Socket
Daly	MacKay	Steele
Dodds	MacKenzie, Annie S.	
Dunbar	Olson	

## The following have passed in Jurisprudence and Ethics:

Abar	Dunbar	Olson
Adams, Harold	Elliot	Porter
Aikins	Gabriel	Robb
Barber	Granovsky	Rogers
Barnes	Hoar	Smart
Barton	Humber	Sockett
Bertrand	Kinsman	Steele
Best	Lawley	Taylor
Cameron, A. A.	Layton	Upton
Crowe	Lumb	Wilson, C. B.
Daly	Mills	Zimmerman
Derbyshire	MacKay	
Dodds	McCutcheon	

## The following have passed in Physics and Chemistry:

Aikins	Graham, J. E.	McLean
Arthurs	Gullett	McLeod, C. S.
Barber	Heal	McLeod, C. D.
Bertrand	Heidgerken	Machen
Bird	Hesson	McMillan
Brown	Hillier	Pearce
Cameron, G. L.	Hindson	Puller
Canniff	Hodgson	Renwick, E. G.
Clark	Herton	Renwick, W. H.
Clermont	Jackson	Riley
Climo	Jarvis	Rivers
Corbin	Johnston	Roap
Coupland	Joy	Robb
Cowen	Kerr	Robinson
Craigie	Langtry	Rogers
Crich	Lawrence	Ross
Crosby	Layton	Rushton
Daly	Lloyd	Shragge
Derbyshire	Mandiville	Smith, F. R.
Dexter	Miller	Smythe, C. W.
Dinniwell	Morphy	Sproule
Dodds	Morrison	Steeves, E. B.
Dunbar	Moyle	Steeves, A. C.
Elkertson	Murdock	Sterling
Elsey	MacKenacher	Vivian
Fennell	MacLeod, J. W.	Wallace
Findlay	MacRitchie	Wansborough
Fonger	MacKenzie, D. L.	Williams
Fullerton	McBain	Wilson, F. St. C.
Gawley	McCord	Wright
Gellatly	MacIntyre	Wyatt
Gooding	McLaughlin	Yoerger

## The following have passed in Anatomy:

Aikins	Calbick	Corbin
Armstrong	Cameron, G. L.	Corrington
Arthurs	Canniff	Coupland
Barber	Carter	Cowen
Bertrand	Clark	Craigie
Bird	Clay	Crich
Blight	Clermont	Crosby
Brayley	Climo	Curtis
Brown	Cook, A. R.	Dexter
Bruce	Cook, H. M.	Dinniwell

Dodds	Kerr	Riley
Elkerton	Killins	Rivers
Elsey	Langtry	Roap
Fennell	Lawrence	Robb
Findlay	Leyroy	Robertson
Fonger	Lloyd	Robinson
Fummerton	Mandeville	Rogers
Fullerton	Miller	Ross
Gawley	Morphy	Rushton
Gellatley	Morrison	Sharov
Gooding	Moyle	Shragge
Graham, J. E.	Murdock	Smith, F. R.
Gullett	MacKenacher	Smythe, C. W.
Hare	MacLeod, J. W.	Sproule
Harris	MacRitchie	Steeves, E. B.
Heal	MacKenzie, D. L.	Steeves, A. C.
Heidgerken	McCord	Stevenson
Hellier	MacIntyre	Sudden
Hindson	McLaughlin	Sterling
Hobbs	McLeod, C. S.	Thompson
Hodgson	McLeod, C. D.	Turnbull
Hurton	McMachen	Vivian
Jackson	McMillan	Wallace
Jarvis	Pearce	Wansborough
Johnston	Prendergast	Williams
Kaye	Puller	Wilson, S. St. C.
Kemp	Renwick, E. G.	Wyatt
Kenny	Renwick, W. H.	Yoerger

The following have passed in Physiology and Histology:

Aikins	Gawley	McBain
Arthurs	Galletley	McCord
Barber	Gullett	MacIntyre
Bertrand	Hare	McLean
Bird	Harris	McLeod, C. S.
Blight	Heal	McLeod, C. D.
Brayley	Heidgerken	McMachen
Brown	Hesson	Pearce
Bruce	Hillier	Porter
Calbick	Hindson	Renwick, E. G.
Cameron, G. L.	Hodgson	Renwick, W. H.
Canniff	Hurton	Riley
Carter	Jackson	Roap
Clark	Jarvis	Robb
Clay	Johnston	Robertson
Clermont	Kemp	Robinson
Climo	Killins	Rogers
Coupland	Langtry	Ross
Cowen	Lawrence	Rushton
Craigie	Lloyd	Shragge
Crosby	Mandeville	Smith, F. R.
Curtis	Mihaychuk	Steeves, A. C.
Dexter	Miller	Sterling
Dinniwell	Morphy	Thompson
Dodds	Morrison	Turnbull
Elkerton	Moyle	Wallace
Elsey	Murdock	Wansborough
Fennell	MacKenzie, Wm. F.	Williams
Findlay	MacKenacher	Wilson, F. St. C.
Fonger	MacLeod, J. W.	Wyatt
Fummerton	MacRitchie	Yoerger
Fullerton	Mackenzie, D. L.	





## There Were Two

THERE were two—and now there is only one. I saw them together for more than sixty years—walking side by side along a narrow pathway leading from young manhood and womanhood, on to the maturity of middle life, and down the western slope to the fading glow of the setting sun. They were never far apart—where he was, she was, and where she was, he was. It was difficult to think of the one without thinking of the other—they had become so much an integral part of each other. Dissimilar in many ways, and yet in all the essential purposes of life—in the ideals, the principles, and the objects of our existence they were one. They had their trials and their triumphs, their sorrows and their joys, their pleasures and their pain—but always they shared them in common lot.

And now he walks alone, while she sleeps peacefully in the little white village on the hill. We laid her away on that beautiful summer eve, with the ruddy streaks across the sky, looking like the dawning of another day, and there was little sorrow—just a sweet and tranquil peace. She had so well earned her rest that it was like the full fruition of a destiny to see her lay down her task and fold her dear beloved hands in the calm repose of eternal sleep.

In all my days I had never seen her rest till then. The constant rhythm of her active life did not falter till the last long surcease came. She had ministered so faithfully to the wants and welfare of others that it seemed strange to see her lying there so quietly and passively, and not the moving spirit of the occasion. It was all so unreal, and to me the dominant note was one not so much of sorrow as of strangeness. I could not adjust myself to the new conditions after sixty years of the old habit of thought. We had all grown to rely so much on her judgment and leadership in all domestic affairs that to be deprived so suddenly of her counsel and help left us somewhat at sea. It was a new experience to plan all things out for ourselves.

Her sphere of activity had not been wide, and during her four

score years she had lived within a few miles of the place where she was born. Yet within this radius she had wrought a world of good. One after another came to me that last day and told me they had lost the best friend they ever had. Wherever there was sorrow or sickness, or death, she was there to lend the hand of help; wherever there was joy she shared the smile.

And this is real service in the world—real success in life. To smooth the rugged path of others, to heal the wounds, to wipe away the tears, to rejoice with the joyful, and hope with the hopeful—to enter into the sorrows and joys of others—this is the acme of human achievement. And she had lived this kind of a life from her girlhood days on down to the final scene when her grandchildren clung lovingly around her bed to fan her waning strength.

We are never able to place a proper perspective upon the future, nor to accurately gauge our emotions. All my life from the time I was a little boy I had dreaded this fateful day. I had never stood beside an open grave and listened to the minister's "dust to dust," and heard the first terrible clatter of earth upon the casket lid that I did not think of the day when it should be my lot to stand by the grave of one of these two, and hear the same sonorous sound. And it has been my constant dread and fear that I should never have the courage to face it, that the thought of that separation would overwhelm me, and that the very light of my life would go completely out.

And yet as I stood the other day and saw her beloved form laid at rest, all the dread of years had strangely passed away, and there was a sweet solace and a calm resignation which filled my heart and permeated my whole being as a blessed benediction. What lament I had was only for him—for the one who had walked all these years so closely by her side. To be able to bear his burden I would gladly have given all I ever possessed. But this could not be. It is his load, his loss, and all the tender compassion and sympathy in the world cannot quite lift it from his consciousness. Brave as the bravest, philosophical as the most, there is to-day something missing from his life that can never be replaced. And yet he, with us, must know that "all is well."

There were two—and now there is only one.

*C. H. Johnson*

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, AUGUST, 1921

No. 8

## EDITORIAL

### Canadian Dentistry and the Newer Standards

THOSE who contemplate taking a Dental Course usually confer with the Dentists of their acquaintance regarding Dental standards and the course of study to be followed. It is, therefore, important that every member of the Dental Profession carefully inform himself upon the newer standards of Dental education, that the questions involved may be intelligently discussed and the best possible advice given to those seeking information.

\* \* \* \* \*

The Pre-Dental Standard is in effect one year of college work beyond Arts Matriculation, embracing the subjects of Chemistry, Biology, Physics, English, French (or alternate language), and when possible, Art and Modelling. The Pre-Dental Year is of University grade, and may be taken at any recognized High School equipped for the purpose, or at an approved College or University.

Just as Medicine has found it necessary to lengthen the medical course from five to six years, so it has been found essential to the efficient training of dental undergraduates to extend the dental course to five years, the first of which is designated the Pre-Science or Pre-Dental Year.

The effect of this added year will doubtless be to gradually move back certain of the pure Science subjects, so that ultimately the last

year of the Dental course will be devoted almost exclusively to clinical Dentistry and hospital practice.

Dental practitioners must of necessity be familiar with fundamental physiological and pathological principles, if dental disease is to be properly treated and the larger problems of prevention successfully coped with.

\* \* \* \* \*

At the last meeting of the American Institute of Dental Teachers it was announced that most of the University Dental Departments had definitely decided to make the Pre-Dental Standard obligatory for Session 1921-22.

All of the teachers were agreed as to the advantages of a five-year course, but it was urged, from the standpoint of public policy, that the profession should move slowly. It was claimed that there had been an actual reduction during the past few years in the number of Dental practitioners in the United States. However, we believe Canada at the immediate present is not suffering from a shortage of Dentists, and, furthermore, we doubt if the adoption of the Pre-Dental Standard would permanently reduce the number of students entering upon the study of Dentistry. It is quite to be expected that higher standards reduce the number of entrants for a few years, but experience has shown that ultimately the higher standards have the effect of attracting the best students and in equal number. And Dentistry needs the best students if her problems are to be scientifically and rationally solved.

Each College has its own local conditions to face, and it is quite conceivable that Colleges in full accord with the general principle may be forced to temporarily defer adoption of the higher standard. Such Colleges must take what action they consider best under the circumstances.

But what should be the attitude of the Dental Profession toward the higher standard? We believe the Dentists of Canada and the United States will give their unqualified support to the five-year course as being in the best interests of Dental Science and public Dental service.

---

FOR VERY SENSITIVE NECKS OF TEETH WHERE THE GUM HAS RECEDED EXPOSING THE CEMENTUM.—Try ten per cent. Formalin solution painted upon dried surface and burnish with hot burnisher. Burnishing with concentrated solution of silver nitrate in this same way will usually desensitize these surfaces. If, however, you do not get results from either of these methods, paint the surface with Buckley's desensitizing paste and cover with a temporary cement, allowing same to overlap gum and fill interproximal spaces for retention and remain on for two or three hours.—*Dental Digest*.



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, SEPTEEMBR, 1921

No. 9

## The Rupert Hall Method for Entire Upper and Lower Dentures\*\*

COMPILED FROM NOTES OF THE MEMBERS OF THE HAMILTON CLINIC CLUB\* H. A. SEMPLE, W. G. TRELFORD, AND OTHERS. EDITED BY W. E. CUMMER, AND REVISED BY DR. HALL HIMSELF.

*(Continued from August Issue)*

### 33. REMOVAL OF THE IMPRESSION.

**I**MMEDIATELY following the crystallization of the plaster, the impression should be removed, dipped or coated with the separating medium, and the stone made, all with the least possible delay to avoid inaccuracy hereinafter described.

Quite occasionally the accuracy of this impression and the peripheral valve seal is such that the removal is somewhat difficult. The process is begun by grasping the impression between the thumb and first finger of either one or both hands and moving the impression up and down or sideways, a slight give caused by ingress of air at one point or other on the periphery may be noted, and the dislodging movement is then directed at this point; at all times gently so as not to dislodge any of the thin plaster lining, and at the same time drawing out the cheeks to break the peripheral valve seal, particular care should be taken in case of undercuts of any size, and once the impression is free, and removed from the mouth, the patient should be instructed to remain motionless, and not empty the mouth for a moment or so, which gives the dentist an opportunity to examine

\*The undersigned would like to express his very great indebtedness to the Hamilton Clinic Club, through the kindness and hospitality of which a large part of this material has been available.—W. E. C.

\*\*Bulletin No. 2 Canadian Dental Research Foundation.

the impression, and, if any small parts are broken off, to search and find these before the patient empties the mouth.

Should however, the impression not respond in the slightest degree by gentle dislodging movements, between the thumb and first finger, wet pledgets of cotton may be applied by the nurse around the periphery. This will probably prove effective, after a short while, but if not the patient is instructed to close the lips and distend the mouth with air. This will invariably dislodge the impression.

#### 34. PREVENTING INACCURACIES AT THIS STAGE, DUE TO EXPANSION OF PLASTER.

Practically all plasters expand somewhat, beginning shortly after setting, and continuing more or less for twenty-four hours. This expansion in an impression, as has often been set forth in the literature, often results in disaster, as noted in Figure 21. Dr. Hall's entire technic in the use of plaster.

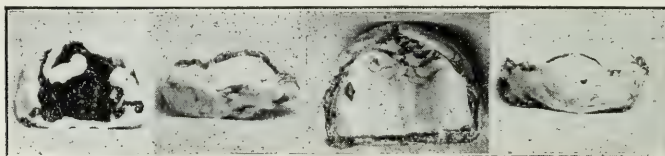


Fig. 21.—Mesial, Lingual and Buccal items of Hall "Cadillac" impression as shown in Figure 14. Note excess on lingual and peripheral valve seal showing through plaster.

#### 35. THE HALL COLLODION SEPARATING MEDIUM.

Dr. Hall's energies have been directed in envolving a fast drying medium giving an impregnable film, which may be applied to a "green" impression evenly and rapidly, and has designed the following formula of Squibb's flexible collodion, thinned with equal parts of alcohol and Squibb's ether, colored by a sufficient quantity of gentian violet. The latter the suggestion of Professor Lancaster, of the Royal Dental College. This should be thinned down to such a consistency that, after the saliva and loose particles of plaster are gently wiped off the impression with cotton and allowed to dry until no free moisture is present when the impression may be taken and totally immersed in this solution for a second or two, lifted out and set to one side to dry, and after the excess has drained off, that no loss of fine lines is noticeable, and that a second "dip" after the first is dry may be given, also without loss of fine lines. This having been accomplished, the boxing of the impression, or the construction of a removable "form" into which the stone is poured and held until it has set is in order, care must be taken to keep the impression during this process from an open flame, as the whole is unfortunately highly inflammable.

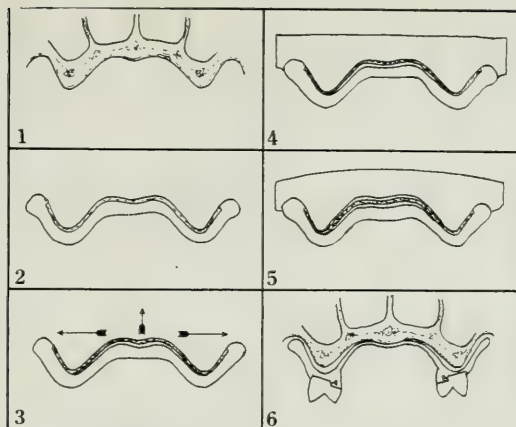


Fig. 22.—Diagrammatic illustration of error due to plaster expansion.

- (a) Section of upper mouth.
- (b) Accurate impression of ditto, immediately on removal.
- (c) Inaccuracy due to possible expansion buckling up the central plaster.
- (d) Inaccuracy of cast, dotted line shows proper contour.
- (e) Result:—denture rides in medium raphe.

Is intended to minimize this as much as possible, as noted in the following:

- (a) Very thin mix; the thinner the mix of plaster the less expansion.
- (b) The use of K2 s04. Prothero and others state that this controls the expansion of plaster.
- (c) Immediate coating of the impression, with a fast drying separating medium, and "boxing" and making of cast, after removal from the mouth. The cast is formed before an appreciable degree of expansion has taken place.
- (d) The use of a "stone" model which does not expand or contract, and is sufficiently hard to withstand the pressure of vulcanization.

### 36. BOXING THE IMPRESSION.

This may be done by taking a wooden paddle, and in the centre of it placing a cone of Harbutt's plasticine, a modeling composition obtainable in schools, or book or stationery stores. Press impression down on this cone so it will be held in desired position, surround impression with strips of plasticine, allowing it to extend from wood to the peripheral border of impression, then trim down all round till peripheral border is about 1-8 inch, higher than plasticine, fasten to wood with melted wax and wrap with a lead band about 20 gauge, which should stand up high above impression and surround with rubber band to hold in position.



Fig. 22A.—A paperhanger's seam roller, extremely useful in rolling strips or sheets of plasticine. Use cylindrical form, as above, not barrel form, as popular with paperhangers.—(Courtesy Ridgeley Trimmer Co., Springfield, Ohio.)

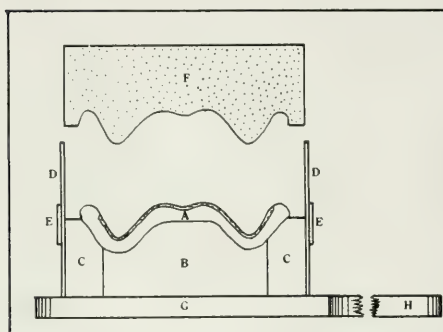


Fig. 23.—Diagrammatic illustration of "boxing" an upper impression.

- (a) Impression dipped and coated with collodion separating medium.
- (b) Cone of plasticine.
- (c) Strips of plasticine, allowing periphery to project 1-8 inch past.
- (d) Soft metal rolled to 20 gauge.
- (e) Elastic, binding altogether.
- (f) Finished model, note the shaping of the model which includes the impression of the lips and cheeks for about 1-8 of an inch past the periphery. This is called "cheek fit" is of considerable importance in securing peripheral valve seal. An ordinary paper-hanger's flat seam roller of 2" length is extremely useful in preparing sheets or strips of plasticine. Keep all wet.

### 37. PREPARATION FOR POURING CAST.

Soak impression in water until it has absorbed all the moisture possible, otherwise if artificial stone is poured in dry impression the moisture will be absorbed from mix and that the cast will be granular. Next, cover impression with lather made with soap and shaving brush, washing it off under the tap, this leaves a soapy film on the collodion, and assists greatly in separating. Absorb any surplus moisture with absorbent cotton, or blow off with compressed air.

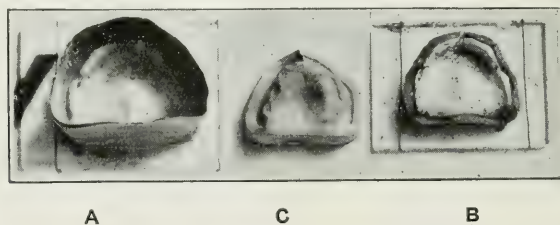


Fig. 24.—Appearance of semi-boxed impression and completed cast.

- (a) Impression supported from below with plasticine, and rim intended to reproduce "cheek fit" so called.
- (b) Boxing complete ready to pour.
- (c) Completed cast, note wide border from cheek fit.

—(Courtesy Hamilton Clinic Club.)

### 38. STONES, THEIR USE, AND HYDRATION.

Prior to the appearance of Spence's plastic compound, which was the first of this series of hard material for Dental Casts to become



known to Dental Profession, plaster of paris was the only known material of which Dental casts or models might be constructed.

Then the well known faults of plaster of compressibility and expansion were, and are even yet in the hands of those who see fit to use it for casts, the source of endless trouble and disappointment due to ultimate distortion of the denture. For these reasons the writer would submit that for Dental casts, in which any accuracy is required plaster of paris should be entirely eliminated.

Spence's plaster compound is an excellent preparation of plaster of paris, Portland cement, and chemicals to control its setting. Weinstein's cast compound is a "Calcium barium silicate" compound, (\*Wilson). Others, "Alston Stone" and "Dentco Stone" are compounds of fine consistency. These materials if properly handled do not expand or contract, and carry about four times the pressure of plaster. The technic of Weinstein's stone involves weighing of the ingredients according to directions, and produces a fine dense cast. The technic of the former and latter involve one 25cc spoon measures of water in the largest plaster bowl and between three or four level 25cc spoon measures of the powder.

In mixing this the three spoonfuls are emptied into the water and a vigorous spatulation with a heavy stiff spatula (Figure No. 18), until a mix similar to liquid plaster mix, (readily dropping off the end of the spatula) is secured, gradually the fourth spoonful of powder is added, while the spatulation continues, until a stiff putty-like mass is secured, which will not drop off the spatula, which requires jarring and assistance into details of impression by a mechanical vibrator and by instruments, if impression of individual teeth are present. The larger the amount of plaster incorporated in the mix, with sufficient plasticity of the mix gives the best results, setting takes place in from four to six hours.

### 39. MECHANICAL VIBRATORS FOR INTRODUCING STONE INTO IMPRESSION.

No well equipped Dental Laboratory should be without one of these, the simplest of these vibrators is the use of a stone, which is out of true, and preferably filled with wax or felt buff in a lathe, the work being supported upon a wooden base or paddle. Dr. Tench, suggests in this connection, a large hexagon nut.

\*See Wilson text Prosthetic article, on plaster, begins page No. 69 (last edition).

A somewhat more elaborate but more efficient apparatus readily installed in a laboratory at a cost of approximately \$25.00 might be made from a piece of brass plate 14" x 6" x 1-8" bolted to a table firmly at one end by means of three ordinary carriage bolts 3-8" x 7" long, on a hardwood block 6" X 3" X 5" and

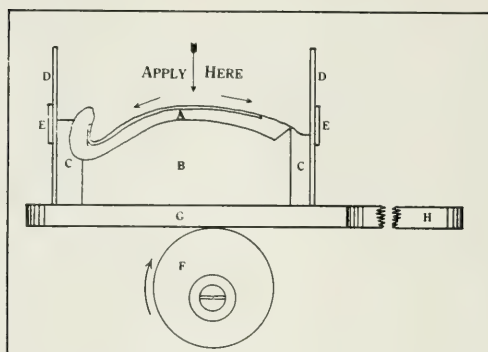


Fig. 25.—A Simple Vibrator.

- (a) A stone out of true and filled with wax, or similar, a hexagon nut.
- (b) Wooden paddle.
- (c) Boxed impression in sections.
- (d) Metal form. Arrows indicate application and direction of flow of material.

having at its free end bolted a small motor with a flat base of the Hamilton-Beach or Dumore, type and with a foot switch similar to a sewing machine motor upon the shaft, is fitted a small eccentric, made from a rod of brass 7-8" in diameter and about 1-2" in width and with a hole drilled 1-8" from the centre. This rapidly revolving eccentric vibrates the whole free end of the plate, and the apparatus is useful for impressions, also filling the largest and heaviest flasks with plaster for vulcanization (Figure No. 26).

Another suitable appliance is stocked with brass founders' and molders' supplies, for vibrating sand molds, as per illustration, and may be installed at a cost of about \$22.00 (in Canada) complete with ingenious and effective knee switch. This is used with block and brass plate as in Fig. 41 in place of the motor.

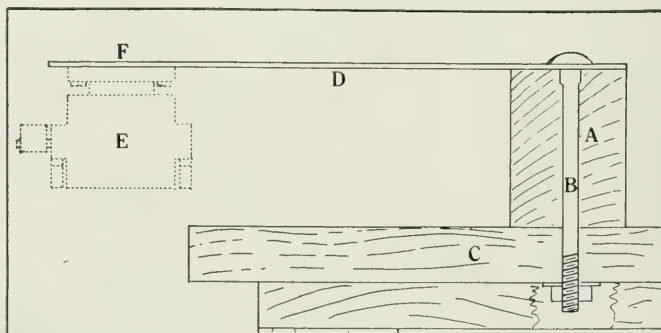


Fig. 26.—Electric Vibrator. The construction of which is described in section No. 41.

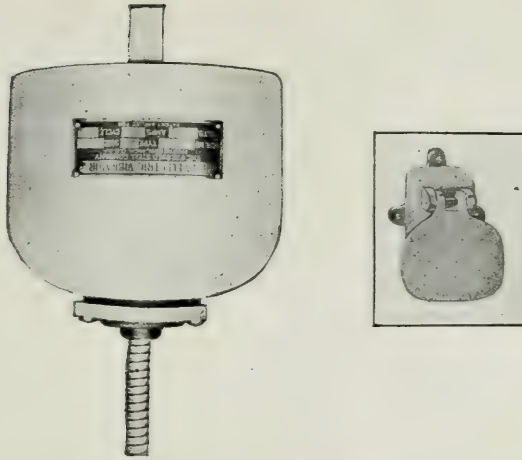


Fig. 27.—Illustration of Vibrators, used by molders and similar manufacturers, and handled by the E. Woodison Co., Toronto.

The above illustration shows the vibrator attached to a molder's box. For Dental use this should be attached on a brass plater mounted as in Figure No. 26, in the place of the motor. A lug is cast on the upper part of vibrator making this simply done. Note knee switch.

This apparatus sells in Canada for approximately \$22.00

The width of the resulting cast is predetermined by the technic in boxing, in which a plasticine rod or strips is adapted around the periphery, and the only remaining dimensions is that of the vertical thickness at the thinnest point.

The capacity of the flask used, (this should be the largest possible) is in the final analysis, the guide for the size of the model, for generally speaking the best results are secured by the use of the largest model, which, with the teeth waxed and ready to flask. This may be estimated and a little mark made in the inside of the plasticine wall to indicate the thickness of the model desired, which should not, generally speaking, be less than half an inch at the thinnest point.

Regarding the actual technic, the entire impression and boxing, lathered with soap with a shaving brush, washed out and the excess moisture blown out with compressed air, leaving a thin film of soap, as already described, the stone about as plastic as well mixed putty is picked from the plaster bowl, and in pieces about double the size of a marble inserted into the centre of the impression, with the right hand, the left hand holding the impression and boxing on the vibrator, which is set in motion by the foot or knee. Immediately the stone will flatten and will travel radially towards the margin. This process is continued until sufficient thickness of cast at its thinnest point is secured, at which time no further material is fed into the impression. The thickness is now noted by the marks previously made or by taking a "sounding" with any straight instrument.

## No. 40. REMOVAL OF BOXED IMPRESSION FROM CAST.

At a time when the initial set\* is complete (which varies from fifteen minutes to three quarters of an hour, at which time it is safe to remove the metal boxing only), the elastic band is removed, and the soft metal boxing gently peeled off, also the plasticine may be removed gently, at this time, the advantage of this is that the edges of the model may be easily bevelled, or carved in any way desired, the material at this stage cutting very readily.

At a period later, from one half to two hours, at which the hard set has taken place, the balance of the impression material is removed, this may best be accomplished by dropping impression and model downward, and preferably in a metal holder, in water previously brought to 180° temperature, *without* a flame beneath the container. The common practice of dropping the impression and model into water at this or a higher temperature, with a flame below, is somewhat risky, especially if the attention of the individual is drawn from the work on hand, resulting in overheating and consequent difficulty in removing impression.

## 41. BRIEF WORKING SYNOPSIS OF HALL "CADILLAC" IMPRESSION.

For the busy dentist this has been thought to be of value, and presupposes the patient in the chair, the examination complete, the mouth made ready for the impression, and all materials to hand, with assistance of dental nurse, or other assistant.

1. Choose and fit tray, by dentist.
2. Tray filled with compound by nurse, dentist secures first impression after check insertion.
3. Tray trimmed down buccally and lingually and below, ready for muscle trim and postdam by nurse, and completed in mouth by dentist.
4. Centre scraped and holed by nurse.
5. Clabber mix prepared by nurse, tray filled by nurse and inserted by dentist.
6. Removal by dentist, boxing and filling by nurse or assistant.

## 42. THE HALL "PIERCE ARROW" IMPRESSION.

This impression, while consuming more time, is superior to the impression just described in as much as the peripheral valve seal in the impression is supported instead of by black compound by a rigid special vulcanite impression tray upon which the Kerrs compound is traced immediately before the insertion of the final plaster lining mix. It involves, as stated below, a muscle trimmed and post dammed impression similar to the "Cadillac" up to the time im-

\*The initial set of any material is that time when the material will support the smaller Gilmore needle of ¼-lb. weight with a point one 12th" in diameter. The hard set will support the larger Gilmore needle of one pound weight and one 24th" diameter. (See Wilson Dental Prosthetic, page 75.)



mediately before the insertion of the lining mix. Instead of however inserting the lining mix at this time, the compound tray is invested with stone or plaster and having been thinned down, is reproduced in vulcanite. The entire periphery of the special vulcanite tray is, at a second sitting, reinforced with plastic Kerr's compound stick by "tracing on," and quickly applied to the mouth. This gives a peripheral valve seal of highest accuracy, and of pressure graduated by the operator. This having been removed and trimmed, the clabber mix is then next made, and the impression completed as before.

#### 43. INDICATIONS FOR THE "PIERCE ARROW" IMPRESSION.

This is the method which may be used in all cases in which it is desired to give the most secure adaptation, regardless of time or time-expense and also in cases in which have been failures from the impression standpoint, in cases requiring metal bases for class 1 cases (see section 11) and also cases where a tight peripheral valve seal is required to develop an undersized ridge (see Figure 3). The peripheral valve seal may be, however, easily overdone, with consequent strangulation and ridge alrophy. See Section 70.

#### 44. MAKING THE SPECIAL VULCANITE TRAY.

Presupposing that the work described in Section 15 to Section 25 has been completed, and that, at this stage, the muscle trimmed and post-dammed impression is ready to be converted into vulcanite rather than filled with the lining mix as described in the "Cadillac" impression. This is now filled with either plaster or stone.

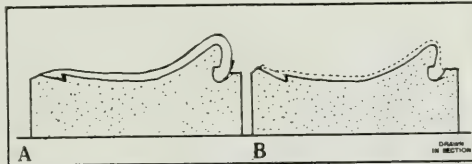


Fig. 28.—Making the vulcanite tray by direct or indirect method.

- A. The impression filled with plaster or stone.
- B. The cast secured after plaster or stone in A has set. This may be invested for vulcanization directly, if the black compound has been previously thinned with a Kingsley scraper or similar. Otherwise it might be better to remove impression and add a single sheet of wax, then invest, which is the indirect method. And the tray constructed in vulcanite either by the direct or indirect method.

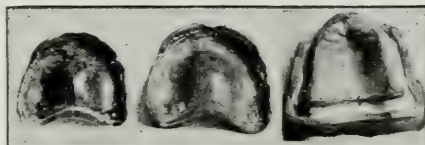


Fig. 29.—Stages in making vulcanite tray.

- A and B, before and after vulcanizing.
- C. A stone model ready for the application of sheet wax for indirect vulcanization of tray. Hole in error, not made till immediately before lining mix.

(Courtesy Hamilton Clinic Club.)

#### 45. TRACING ON COMPOUND FOR PERIPHERAL TISSUE COMPRESSION AND VALVE SEAL.

One of the great advantages of this method lies in the fact that the entire peripheral valve seal may be fitted in one operation, because of the previously fitted rigid vulcanite base support for the peripheral valve seal material, rather than the black compound plastic support plastic at only twenty degrees of heat, above the Kerrs compound tracing material, as used in the "Cadillac" method. This makes it possible to bring the entire periphery to a uniform heat, in hot water, and by quickly inserting in the mouth in this state, a periphery valve seal of highest accuracy may be secured.

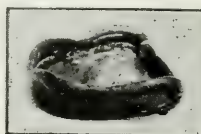


Fig. 30.—Kerr's compound "traced on" the periphery of a vulcanite tray. This is heated uniformly in a small flame, dipped in water at 160° to prevent burning the tissues, and inserted in the mouth. The above shows the hole already drilled; this is in error, as the adhesion may be better checked by leaving the hole till after the new peripheral valve has been completed. See Fig. 14.

To trace Kerrs compound on the vulcanite tray, after having been filed smooth (not necessarily polished), is dried and the end of a stick of compound heated in a small flame, also rotated between thumb and first finger. This fairly uniformly heats the end of the stick for half an inch or so, at which time the softened and almost dripping end of the stick is applied to the periphery, and also rotated. A little practice will enable the dentist to rapidly and accurately "trace on" compound in any desired thickness or width. Fig. 14.

Having quickly accomplished the tracing on of the periphery compound, it is evenly heated by immersing in hot water at 160° until the entire periphery is softened to about the consistency of, for lack of a better example, chewing gum, at which time the tray is inserted in the mouth, with massage movements hereinafter described.

#### 46. THE PRESSURE OF THE APPLICATION OF THE PERIPHERAL VALVE SEAL OF THE IMPRESSION.

Some judgment and experience is required to gauge the pressure, the chief liability to error being too great a pressure. Heavier pressure up to say 10 lbs. are indicated in cases of hard dry ridges, especially if a slightly metal base is used, or in cases in which it is desired to force back the peripheral flexible tissues, the operator keeping well in mind the danger of strangulation. For practically all other cases lighter pressure merely sufficient to print well the contours of this flexible peripheral tissues in the softened compound are sufficient.

#### 47. REMOVAL, HOLING, AND TRIMMING OFF EXCESS.

A surprising resistance to removal at this stage will be encountered, which is explained in Section 17, similar to the "Cadillac" impression. The excess compound about the peripheral valve seal should be trimmed to a width of about 1-8 of an inch, except the post-dam, which is approximately twice this width. A hole of about No. 9 gauge Brown & Sharpe should be drilled in the centre of the impression, which will instantly relieve the strong retention just described.

#### 48. BALANCE OF THE IMPRESSION.

The remainder of the impression consists in moistening the tray, also the valve seal, applying the lining mix as described in Sections 30 and 31, inserting with the pressure governed by consideration described in Section 46, removal, boxing, coating with separating varnish, and making the cast as described in Section 33.

#### 49. BRIEF SUMMARY HALL "PIERCE ARROW" IMPRESSION.

The first four steps and the last two are identical with the "Cadillac" impression, and are as follows:

1. Choose and fit tray by dentist.
2. Tray filled with compound by nurse, dentist secures first impression after check insertion.
3. Tray trimmed down buccally, lingually and below ready for muscle trim and post-dammed by nurse, and completed in mouth by dentist.
4. Centre scraped and holed by nurse.
5. Make special tray of vulcanite, add new peripheral valve seal with Kerr's stick compound.
6. Clabber mix prepared by nurse, filled by nurse and inserted by dentist.
7. Removal by dentist, boxing and filling by nurse or other assistant.

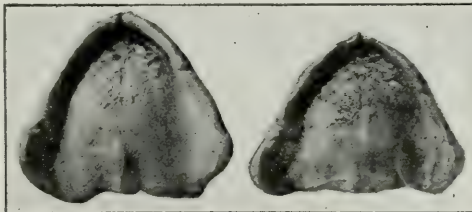


Fig. 31.—Two Hall "Ford" impressions. This is a rapid impression made by a single insertion of black modelling compound, edges thinned, with or without muscle trim or post-dam, and a single lining mix of plaster, with or without an escape passage. The most rapid of the Hall series (15 minutes) and suitable for a large number of conditions.—(Courtesy S. S. White Co.)

## 50. THE HALL "FORD" IMPRESSION.

This is the most rapid of the Hall series, consuming ordinarily about fifteen minutes, and may be used in a large number of Class 2 cases (see Section 12,) in which time and expense may be a consideration. It is less suitable for cases of any particular difficulty because the peripheral valve seal is not carried to as accurate an adaptation in previous methods, as will be noted, but the safest impression from the standpoint of strangulation of the tissues.

## 51. SECURING THE FIRST IMPRESSION, AND ITS PREPARATION FOR THE LINING MIX OF PLASTER.

This process is identical with that described in Sections 15 to 20 up to the point of beginning the muscle trim and post-dam, leaving an impression with a semi-massage margin, and trimmed approximately to the contours of the finished denture. Depending upon the circumstances, the operator need not further muscle trim or post-dam, but should satisfy himself that the margins are approximately slightly less than the correct heights, and that the impression extends at least 1-8 of an inch on the moving soft palate, the centre may or may not be scraped, but it is advisable, and also the relief passabe for plaster of No. 9 gauge B. & S., is quite unnecessary.

## 52. COMPLETING THE IMPRESSION.

The lining mix is added as already described, although a somewhat smaller amount than either of the other two methods, because of the lesser removal of the black impression material, also lighter pressure for fear of displacing soft tissues, and also a somewhat softer mix of plaster. Boxing and pouring of cast as already described.

## 53. BRIEF SUMMARY OF STEPS HALL "FORD" IMPRESSION.

These are as follows:

1. Choose and fit tray, by dentist.
2. Tray filled with compound by nurse, and applied to mouth by dentist.
3. Tray trimmed down buccally and lingually by nurse sufficiently low to allow for plaster periphery without tissue.
4. Lining mix inserted by nurse, insertion and removal by dentist, making cast by nurse or other assistant.

## 54. HALL LOWER IMPRESSION.

Since human teeth have been lost, and full lower dentures have been made, has the full lower denture been a problem, because of its comparatively small area of adhesion and constant displacing movement by the tongue and cheeks. While Dr. Hall does not



assume that this system will give full lowers adhesion as in uppers, yet, the technic he suggests and the theory upon which this is based leads in most cases to surprising results and in a few, adhesion similar in efficiency to the upper.

#### 55. THE RETENTION OF THE FULL LOWER DENTURE.

The scheme of retention of full lower dentures is that or, so far as is possible, adhesion, over as large an area as possible, between the film of capillary aerated saliva between the base and the mucoosa, and cohesion in the substance of the saliva itself. Peripheral valve seal, aiding in securing a tidal vacuum, is sought after, but is usually difficult because of the loose and highly mobile character of the more especially the peripheral flexible tissues adjacent to the tongue. All of the above is somewhat aided by gravity.

#### 56. EXAMINATION OF THE LOWER MOUTH.

Based on material in Section 9 to Section 12, both an ocular and digital examination should be made, with the tongue in a raised and lowered position, the digital to estimate approximately the amount of pressure or peripheral valve seal these loose tissues will carry. Also a digital examination in the closed position in the mouth, in the buccal and lingual mouth to note, as far as possible, the positions of the muscles during stress, all of which assists the dentist to form in his mind's eye an outline of the future denture covering as much area as possible, with peripheral valve seal yet avoiding all contracting muscles.

#### 57. FITTING THE TRAY.

Having this in mind, a lower tray is chosen and fitted, as large as possible and preferably an 18 or a 19 because of the long lingual flange at the position of the Mylo-hyoid ridge, a part which should be covered if at all possible, and covering as large an area as possible up to about 1-8 of an inch short of the peripheral valve tissue. This may be best done with the operator standing as far as possible directly in front of the patient within easy reaching distance, and with the elbow about on a level with the patient's mouth.

#### 58. APPLYING THE MATERIAL TO THE TRAY AND INSERTION.

Somewhat different in detail is the manipulation of the material for the lower, as described in Section 16. The preparation is identical up to the stage of the ball rolling upon the middle fingers (see Section 16), but having driven all the creases below, the thumb, index, and middle finger of each hand are stretched out straight, and by pressing these against the plastic material, it is elongated into the form of a square rod about four inches long and approximately 3-4

inch by 3-4 in. in sections. This is bent to the form of a tray, lying on the bench with the handle down, and by a wiping motion of the first finger and thumb, secured to it, the thumb lapping the material over the flange of the tray around its entire circumference to prevent its dislodgment during the impression, but allowing its easy removal after the impression. The impression is now passed over the flame and dipped in water at  $160^{\circ}$  to prevent burning.



Fig. 32.—Position of finger and thumb in shaping square rod for lower impression.

It may be seen that pressure exerted will naturally develop a square rod of the plastic compound. (B) Adapting square rod to tray.

#### 59. INSERTION, CHECK IMPRESSION, AND IMPRESSION.

From the position named in Section No. 57, the impression is inserted, right heel first, with or without a mirror, similar to that described in Section 17, and with the handle of the tray directly below the patient's nose as a guide, and the middle finger and the thumb of each hand respectively on the centre of the flange and under the chin of the patient, leaving the handle clear, a light print is made for checking. The impression may either be lifted out of the mouth bodily, or tipped up sufficiently to check the impression for centring, and if correct, with the thumbs and middle fingers as above, the impression is gently carried to place, leaving a thickness of at least 3-16 of an inch at its thinnest point, at which time the patient is requested to protrude the tongue, and then swallow if possible, object to approximately form the entire lingual margin.

#### 60. MASSAGE OF THE MARGIN AT THIS STAGE.

Immediately after the impression is home, keeping the index finger merely touching the impression, the thumbs are drawn up from under the jaw, and a massage, directed as to pressure and direction similar to that described in Section 18-18 is done. The thumbs will readily cover the whole of the anterior two-thirds of the impression, and should it be difficult to reach the posterior third, the position may be reversed and the massage completed with the middle finger, with the thumbs resting lightly on the upper surfaces of the flanges of the impression tray. Subsequent to this the impression is removed. The object at this stage is to secure an impression if anything a trifle too large, for subsequent reduction by manipulation. (See Fig. 33.)



Fig. 33.—Position of the hands of operator and of the face of patient in massage of margins of lower impression. See Sections 18 and 19.

#### 61. TRIMMING AND PREPARING FOR MANIPULATION UPON THE PERIPHERY.

Due to the more fragile form of the lower impression, it is wise to do as much thinning as possible to the periphery of the impression while it still remains in the tray. The requirements are to thin the margin for subsequent massage, and muscle trim, and not over the crest of the periphery as in Figure No. 11, but to a rather finer edge, because of weaker tissue action. After the lower impression is released from the tray it may be strengthened by bending a piece of No. 18 gauge wire to its approximate form, heating it approximately to  $160^{\circ}$  and dropping it into the substance of the impression material.

#### 62. MUSCLE TRIM OF BUCCAL AND LABIAL BORDER.

This is largely a correction of the massage movements with the impression (now without the tray) as described in Section 22 and 23, and consists of warming the margin and carrying the material to the lips and cheeks to a position where it exerts a valve fit upon the entire flexible peripheral tissues identical with the upper condition shown in Figure No. 7.

#### 63. MUSCLE TRIM FOR MASSETER MUSCLE.

Frequently this muscle will engage upon margin of the impression, and the impression at this stage must be warmed at its buccal distal half, inserted and the patient instructed to close gently, the dentist having both thumbs upon the impression. This causes the muscles to contract, and leaves the middle fingers free to massage the margin, keeping it in a position of valve fit against this muscle.



Fig. 34.—**First adaptation of compound to tissue.**

Immediately preparatory to making the individual tray, note material lapped over border of tray.—(Courtesy Hamilton Clinic Club.)



Fig. 35.—Compound tray removed from impression tray and trimmed for muscle trimming.—(Courtesy Hamilton Clinic Club).

#### 64. MUSCLE TRIM, LINGUAL ANTERIOR HALF OF LOWER IMPRESSION.

This may be done by softening the thinned margin of the impression over a fine flame, quickly reinserting and asking the patient to touch the roof of the mouth with the tongue. This will probably turn back some of the material at the edge, especially to accommodate the frenum. If no material is turned back, then there is a deficiency and Kerrs compound should be traced on until it does turn back, which should have ample space to move, with of course valve contact. It may be necessary to reheat at this point of the frenum to secure this, after each heating and muscle trimming, the wet fingers should be passed across this part of the margin of the impression, depressing it into contact with the floor of the mouth, as the raising of the tongue almost invariably turns up the margin at this point.

#### 65. MUSCLE TRIM, POSTERIOR HALF OF LOWER IMPRESSION.

This may be done to soften both distal lingual halves (together), and inserting quickly asking the patient to close and swallow. This should turn up the material, and if it does not more should be added till it does turn up. This operation will give a very definite though probably incorrect form to the impression at the mylo-hyoid ridge, which is corrected at the next stage .

#### 66. CORRECTION AND RELIEF AT MYLO-HYOID RIDGE.

A little careful handling of the impression at this stage will prevent almost certain chafing, because the posterior muscle trim just described will almost always turn the material beside, below, and



slightly under the mylo-hyoid ridge, attaching the mylo-hyoid muscle, part of the so-called floor of the mouth. By trimming this on the inner side in such a manner as to allow the plaster of the lining mix to secure the impression of this in repose this difficulty will be eliminated as in Figure No. 36.

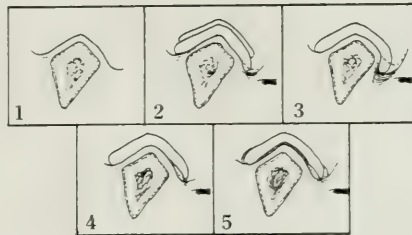


Fig. 36.—Relief of lower impression for Mylo-hyoid muscle.

1. First impression likely past the mylo-hyoid ridge, but much turned away from it.
2. Swallowing against softened margin turns the impression beside and partly beneath it. If denture is made in this form severe chafing will result.
3. Trimming of compound off the inner side relieving this altogether.
4. The lining mix then receives the contour of this tissue that rests, which will probably not chafe this part.

#### 67. PREPARATION OF LINING MIX, INSERTION AND REMOVAL.

This process is identical with the upper, except that a trifle more plaster than one to one is used, perhaps a spoon and a quarter. This gives a slightly thicker mix, which is desirable to counteract the dissolving tendency of the saliva, and requires the same pressure to seat as the upper because of the smaller area. The impression is seated by an intermittent motion, the patient is instructed to protrude the tongue and return it to place, and the impression is then let go until the plaster has reached a state of crystallization, at which time it is gently removed.

#### 68. APPLYING COLLODION, BOXING, FILLING AND SEPARATING.

After removal from the mouth, the loose fragments and saliva are carefully wiped off with cotton, and the impression is given a double dip in collodion as described in Section 35, standing it heels downward and upright, for drying. The boxing is very similar to the upper, except that the space between the flanges is first fitted with plasticine rolled to a sheet of about 3-16 in. thickness, cut to the approximate form, approximately fitted and with thumb and first finger carefully expanded to place. Owing to the more fragile character of the lower impression this should now be supported with a mix of plaster. The balance of the boxing and filling and separating is identical with the upper, Figure No. 37.

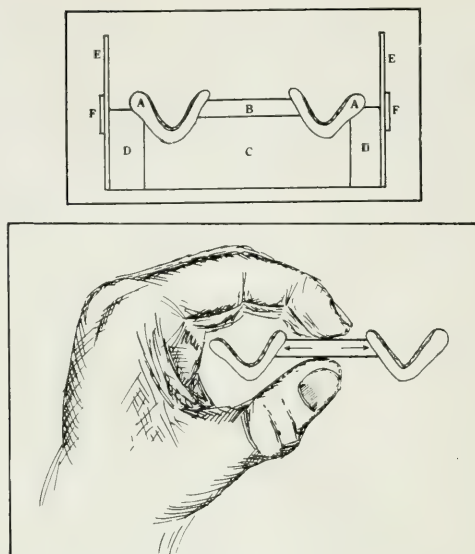


Fig. 37.—Boxing for full lower impression.

The main point of difference between the boxing for lower and upper Figure No. 19 is the plasticine sheet which A. Is cut to approximate form and expanded by pinching against the side of the lower impression, and is supported first by plaster. B. After which the boxing is completed same as the upper. Removal of the boxing after initial set, trimming and final removal after hard set is identical with the upper. See section 40.

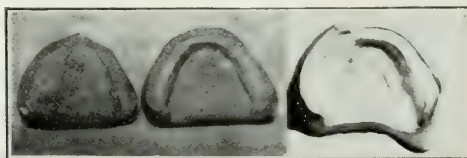


Fig. 38.—A and B showing an ideal upper and lower casts developed by technic herein described.

C. Case of a lower denture exhibiting unusual adhesion, quite as much as a good average upper made upon above principles.

### 69. BRIEF SUMMARY OF STEPS, FULL LOWER.

These are as follows, examination being complete, everything made ready.

1. Fit tray, wide as possible, allowing 1-8 of an inch for material past tray.
2. Apply material to tray, insert, examine to check centring, reinsert, with massage.
3. Trim, remove from tray, complete trim, reinforce with wire.
4. Massage and muscle trim, buccal and labial borders.
5. Muscle trim anterior lingual half.
6. Muscle trim posterior lingual half, trim for mylo-hyoid.
7. Lining mix, insert remove, dip in collodion, box, pour, separate.

## 70. AVOIDING EXAGGERATED BORDER PRESSURE.

A natural enthusiasm upon the part of those using the above methods has resulted, in many cases of, following the use of the "Pierce-Arrow" and "Cadillac" impressions, of a most disappointing loosening of the dentures, in periods of time from a month to six months. The reason has been practically uniform,—and is that of exaggerated border pressure, either outwards, against the flexible peripheral soft tissues, or inward, against the mucosa directly overlaying the alveolar process itself, or both of these in combination.

Naturally this interferes with the blood-circulation, and also with nutrition through disturbed trophic nerve function, resulting in ultimate atrophy of tissue and loss of tissue contour and consequent adaptation and adhesion. Hence, during the final application of the "clabber" plaster to these impressions, great care should be taken not to drive the raised periphery into the tissues and almost imbed it there, but to use a light pressure sufficient to produce the very slightest additional border pressure. Under the combined enthusiasm of the patient and operator for a close adaptation, this is very apt to be done, but may be avoided,—and the patient should be warned of this possibility;—the change of shape of noses from eye-glasses, and the loss of hair (alopecia) from tight hatbands being somewhat of similar character.

## 71. THE CHOICE OF METHOD AND CONCLUSION.

Recalling the concluding sentence of a paper read before the National Dental Association, 1921, (For paper in full, see National Dental Journal, an early issue) "a well adapted denture, without compressing tissues, that fits *moderately* well, has proved the desirable plan in the practice of the essayist, and he has found himself returning more and more to the original impression technic given in the straight compound tray and plaster without peripheral pressure and post-damming. (Ford impression).

Dr. Hall has further stated that slight peripheral border pressure has a place in special cases as so-called "treatment cases," or those in which as in Fig. 3, in which a ridge is practically developed from its overlying soft tissue by border pressure, or in cases in which for psychological or other reasons a tight adaptation is required, which may or may not be more or less temporary, that the first named impressions have a very definite place;—but that, in his opinion, a much more extensive use should be made of the simpler impression, by reason of its comparative safety from atrophic sequelae, even if of more moderate tightness of retention;—which is a matter for congratulation in a sense, bringing the prospect of good dentistry, for a larger number, with adequate reward for the dentist and at moderate fees for the patient somewhat less remote.

## The New Era in Dentistry

JAMES GREGORY O'NEILL, D.D.S., PORT ARTHUR, ONT.

UNDER the above caption the Profession of Dentistry will be described as passing through the series of changes that we all know is coming about. We can allow ourselves to be visionary, and in a common sense, practical way, form a mental picture of the future of our Profession.

Dentistry, at the present time, is in a transitory stage. The change of heart that it is taking on, we are glad to say, is not a step of retrogression, but an onward and upward process. It is slowly emerging from the sphere of a profession of applied mechanics into the higher plane of scientific knowledge and preventive medicine.

If any of us will allow ourselves to retrospect in a sane, unbiased, unegotistical way, we cannot help but think that our avocation, as most of us have practised it, has greatly and almost wholly been of a mechanical nature. We know that our mechanics call into play, on a minute scale, the basic principles of engineering. Our execution of these problems has not been an exact science. The problems of the engineer are more complex than ours. He is constantly engrossed in calculus, trigonometry, and all the higher mathematics, then transferring his results to his drawings and blue prints, and concluding with his final objective. Every step is the result of some mathematical equation which in itself is the essence of exactness. So we cannot clap ourselves on the back, and throw out our chests with false and vain thoughts as to our skill as constructing engineers. We have a long way to go, and much to learn, to qualify on the same scale with the engineering profession.

Our true place is not among the mechanical professions; therefore we must get away from thinking in the mechanical. Yet the fault can scarcely be laid upon our heads if our minds have been running in this groove. The thing that we were taught in College as being the most essential part of our work, and to which we gave most of our time, was mechanics. Schooled in this thought in our youth, we find it difficult to think in any other terms.

At school we had lectures and clinics in Pathology, Bacteriology, Histology, Anatomy, Medicine and Surgery; but at that time, and for many years after our graduation, how much importance did we attach to these subjects? About as much credence as I have for the theory of verbal communication with departed relatives in other and more celestial worlds than ours—absolutely none. When we finished our courses on the above subjects we couldn't dispose of our text books quickly enough, and now how we wish we had kept them, and tried to acquaint ourselves with their contents a great deal more.

Most of the text books that we have bought since graduation



have been on some subject dealing with the problems of the mechanics of our work. To-day this is not the case. The books that we are now getting deal entirely with another side, that has been pretty much foreign literature to us in the past. The books with the following titles are most indicative of the new era through which Dentistry is passing: "Diseases and Special Surgery of the Mouth and Jaws"; "Oral Anesthesia"; "Pathology, General and Dental"; "Oral Sepsis in Its Relation to Systemic Disease"; "Interpretation of X-Ray Pictures"; "Fractures and Dislocations of the Jaws."

The uppermost thought in the minds of the men who have a high status in the profession is, as far as possible, to infuse into us the urgent necessity of our reading and studying upon the subjects that have been listed above, and then we will more closely approach our place in a true sense as one of the specialties of Medicine and Surgery.

The lack of the application of any of the knowledge that we may have had on Pathology, Bacteriology, and kindred subjects was strongly brought home to me while at Johns Hopkins Hospital during the past year. I spent most of the month of January at this famous institution, where, due to the courtesy and kindness of Dr. William A. Frantz, one of the brightest Urologists on the American continent, I had access to all the laboratories and clinics in the place. The whole process of their scientific treatment of their subjects was both a happy and sad revelation to me—happy in the fact that the Profession of Dentistry was slowly poking its nose into the scientific and medical field, where it rightfully belongs; but sad in the thought that our knowledge was so meagre on the very things that we now need for the universal uplift of the profession.

The subject of Oral Anesthesia will be much and greatly practised in the future. This is not a subject that can be treated in a haphazard manner. It must be obvious to us all that in order to do this intelligently, and with a degree of success, we positively must have an intimate knowledge of all the anatomical parts affected, with their relations and functions. We must know where every move of the needle takes us, just as the head surgeon knows when he is doing a mastoid operation. It seems that we must go away back to our first days of study at College, and dig up our Gray's Anatomy, get a skull, and review everything we once learned, only this time we must not cram as we did for examinations, but retain it with a vengeance, so that we can apply the knowledge in our work.

In Exodontia and minor oral surgery we are meeting the same pathological conditions that we have been coming in contact with for years; but the manner in which we now treat cases coming in this category is vastly different from our methods of past days. Here a new field has been opened up for us—the field of true surgery.

We are not any too conversant with true surgical procedures, because we have not been in the habit of doing things just in that way. We have got to get right down to it now. The surgical preparation of the mouth takes in drainage of a wound, incision, excision, reflection of the muco periosteum, alveolectomy, the knowledge of the different kinds of sutures, how, when, and where to employ them, and last, but not least, a surgical sense. So you see right in this field alone we must get it up by reading and clinics. The method of curetting the tooth sockets after the extraction of the tooth is not compatible with surgical principles. If we are going to remove all pathological areas that occur contiguous to the teeth we must expose our infected areas to view, then we positively know what results we are obtaining.

We must know a little more about taking smears, preparing and spotting slides, and the principles of growing cultures. We don't know a great deal about blood pressure, specific gravity of urine, heart lesions, arthritis, and the myriad of other things that may be the result of a focus of infection within the oral cavity. It is not my intention, in the least, to drive you into other fields than our own. But from the manner in which we have been doing things in the past, one would think that the mouth and teeth had no intimate corelation with the rest of the body. We certainly can find quite enough interesting work within the oral cavity to occupy most of our time. And if our time is going to be devoted to this field alone, we surely shall be better able to diagnose and treat all the conditions that arise therein in a much more efficient and intelligent manner if we understand the process of the principles of pathology and bacteriology.

In the first stages of this paper I may have created the impression in your minds that I looked upon the mechanical side of our work in a disparaging way. That was furthest from my mind. This, indeed, is a most laudable and commendable side of our labors, and we should give the best there is in us when we are doing it, because for many years to come there will be so much of it to do. We are not going to evolve into any idealistic period in a day. That will be a process of many years. The mechanical side has been treated in this paper in the manner that it has, for the purpose of stimulating and retaining in our minds the desire to learn and know the things that will make us infinitely better Dentists, and it will be the great means of raising the standard and status of our profession far above what it is at the present time. By the better understanding of the influence of pathological and physiological states on the oral conditions, we can exercise better judgment in the technical work performed for each patient as an individual, and take our place as Dental Specialists in the general science of Medicine.

We, as Dentists, seem to be hearing, reading, or coming in

contact with some new theory every month. They have come so quickly in the last few years, that we are at a loss to know just what we should do in the most conscientious way for our patients. There are three schools of thought in the profession to-day—i.e., the radicals on one side of the road, the conservatives on the other, and the great majority treading the centre path, with tendencies to the one side or the other. We have got to standardize the new Dentistry at some point, and in so doing let us try to use one of the greatest attributes that God has bestowed upon man—COMMON SENSE. This very elusive common sense may be said to be a safe and sound practical judgment, based on well-established premises. These premises are usually drawn from a more or less broad knowledge of facts reduced to a few obvious principles. The practical conclusion, or common sense judgment, is a simple, logical deduction.

Any theory that is not based on realities, that does not meet facts and conditions, will soon be discarded as unworkable, and therefore unsatisfactory. Any plan for the betterment of Dentistry that is not in conformity with the nature of modern scientific medicine, and is not based on clear rights and obligations, with their consequent duties, will never stand the test of time or experience for any length of time. Our one aim must be to give the patient a SQUARE DEAL, and in thus acting fairly with the patient, giving him as nearly a hundred per cent. of modern dental treatment as is reasonable or within the range of common sense.

There is such a natural and ever-growing tendency amongst us humans to get what we need and what we think we have a right to in the matter of health, that the present onward and upward movement in the profession of Dentistry was inaugurated, and is now active in the souls of men who are devoting their lives to the prevention, alleviation and care of disease in man. Many minds are thinking about the great scientific truth involved in human health welfare; many hearts are enthusiastic in their devotion to better health for all; and many lives are consecrated to the unselfish service of those who are suffering.

Organized society, through its various units (country, state and nation), is giving careful thought and ever-increasing attention for the working out and solving of the many complex problems that lie at the root of human disease and physical suffering.

The Medical Profession is being prepared and preparing itself throughout the United States and Canada, with a very unusual degree of enthusiasm, to administer, through more scientific and thorough diagnosis and treatment, a larger and more conscientious measure of medical science and skill to every human who comes into their hands for professional care. The medical profession is whispering: "Come on, Dentistry; be a much closer comrade than you have been, and exhibit more keenness and intensity of purpose



for the betterment of human health, and work hand-in-hand with us, as we need you." The medical men realize that we must assume a new obligation, and unless we are up and doing with a vim and a vengeance, and seize the opportunity that is at our very door, Dentistry will go back to its place of applied mechanics.

The above resume is a fair estimate of the higher, better aims and purposes at work to-day on this Northern Continent in the cause of human health. This would seem to express the residual truth after all individual, associational, and institutional selfishness, ignorance and error have been drawn off. There is a sincere effort being made on all sides, by all professional groups, to take better care of human health.

For the rest, we need sincere and unselfish thinking, severe limitation of personal interest and private profit, with enlightened recognition of truth and worth whenever found, combined with a stern sense of loyalty to a cause or an ideal.

---

### The Milwaukee Convention

---

KENNETH M. JOHNSON, D.D.S., WINNIPEG, CANADA.

---

THE Silver Anniversary Session of the National Dental Association was held at Milwaukee during the week of August 15th.

As this is the largest Annual Dental Convention in the world it is probable that a brief account of impressions gained there by a Canadian, may be of interest. Through the courtesy of the Association any Canadian Dentist in good standing is admitted to the privileges of this great organization as a guest, and as usual a number of our men availed themselves of the opportunity. In this connection it would appear that the ethical dentists of Canada should be organized and that the organization so formed should provide its members with proper credentials so that foreign organizations granting these privileges may not be imposed upon.

The convention proper may be divided into three parts, the papers, the clinics and the exhibits. The papers, of course, are all reprinted in The National Journal and may be read by anyone interested, and while printer's ink cannot always portray the speaker's personality, still the theme he has brought before the profession is faithfully reproduced. The clinics, on the other hand, are given on such an elaborate scale that one could not hope to describe them with any detail in the space provided. Dr. Price was received as enthusiastically as ever. His paper was entitled "Researches on Fundamentals Underlying Dental Diagnosis",—a National Convention would not be a National Convention without him. In the papers this year special stress was laid upon diet and its relation to Dentistry, in fact two of the evening



lectures were on that subject. One was by Dr. McCollum of Baltimore, who held his audience spell-bound for two hours, and the other was by Dr. Seccombe of the Royal College of Dental Surgeons, and it was indeed a delight to the Canadians present to observe the applause with which he was received.

Probably the feature which interested the majority of the members was the extensive and elaborate system of clinics. These were carried on by Clinic Clubs and individual clinicians for three days, and the benefit derived by the profession must be immeasurable. The privilege of listening to, observing and questioning these leaders of everyday practice who demonstrate their efforts in a practical way is payment indeed for the time spent in attending such a convention. The latest technic in every branch of Dentistry was here shown, and the thoroughness exhibited by these men was wonderful indeed. From discussion with many of these leaders the following conclusions seem to be indicated,—Firstly, that root-canal operations while neither entirely discouraged nor entirely encouraged, are being put upon a much more sane and more careful basis,—Secondly, that the fixed bridge is still popular where indicated and that satisfactory vital abutment inlay attachments can be made,—Thirdly, that “removable” bridge work has come to stay and that care in choosing a proper place for it and thoroughness in its construction will not cause us to regret its advent,—Fourthly, that preventive Dentistry is the order of the day. With regard to the Clinic Section, it has frequently been suggested and I believe would react most favorably if a small, but strong, representative group of Canadian Clinicians were to present their efforts to these conventions.

The efforts of the exhibitors, I may say, were crowned with success. Their display was most interesting and complete and I cannot pass without mentioning the general applause which greeted a compliment to them from Surgeon General Ireland in his address before the Association. One other thing impressed those of us who visited the Convention and that was that the members of the National Dental Association are one and all good fellows and good people to know.

---

TO LIGHT GAS WITHOUT A MATCH.—Some time you might want to light your gas or alcohol lamp quickly, and have no match within reach of your free hand. If your electric cautery is convenient, it will do the lighting for you.—*J. F. Nelson, Washington, Iowa.*

FOR VOMITING DURING UPPER PLASTER DENTURE IMPRESSION.—Place a dam of bees wax across the heel of your impression tray to confine the plaster, spray the throat with camphor water or with two per cent. solution cocaine or novocain, or in most severe cases where the spray will not suffice give the nerve block injection.—*Dental Digest.*

# Dental Nomenclature

---

REPORT SUBMITTED TO MEETING OF DENTAL EDITORS' CLUB,  
MILWAULKEE, AUGUST, 1921.

---

L. PIERCE ANTHONY, D.D.S., PHILDELPHIA.

---

IT is with some temerity that I undertake the task which our host so lightly imposed upon me at the first meeting of this group in Boston, and it is only with the assurance of the moral support of my two colleagues, Drs. Seccombe and McGee, together with my intense interest in the subject and the hope that I may stimulate the active interest of others present that I am emboldened to offer what Dr. King has chosen to call a report on Dental Nomenclature.

The development of the science and art of dentistry is going forward with such rapid strides that our present terminology no longer meets the demands of writers and clinicians who endeavor to convey in a clear and understandable manner the results of their efforts.

The literature of a profession is its life-blood. It is the medium which, circulating through the professional structure, provides for that interchange of ideas essential to its development and growth. Through its literature, also, each profession becomes acquainted with the state of development of its sister professions and each profession is judged as to its intellectual stature and the verity of its accomplishments by its literature.

So also are the scientific status, exactness of knowledge, cultural developments and mental habits of the profession distinctly reflected by its literature and the retarding influence of insufficient and defective vehicles of expression must be removed if we are to keep pace with the other learned professions.

The varied operations and methods of procedure in dental practice demand a nomenclature capable of expressing the refinement and differentiation of meanings peculiar to dentistry, which can only be supplied by an ample and discriminating technical terminology and our present dental nomenclature falls far short of such requirements.

None realize more forcibly our deficiencies in this respect than those who are daily endeavoring to assist authors in conveying their thoughts in language that will be clearly intelligible to their audience. We are all aware of the failures of these endeavors at times solely as the result of the lack of tools with which to work and each instance of such failure impresses upon us a crying need and an intense desire to improve the conditions.

It is quite apparent that the busy practitioner is indifferent to this important phase of our literature, seemingly being content with and

almost demanding that the subject be dealt with by those intimately concerned with the historical record of dentistry in the literature,—namely, teachers, writers, editors, etc.

It is thus my belief that some such body as that here gathered will be the proper one to undertake the task involved in the harmonizing of our present terminology and enlarging it to meet our requirements.

Since the notable efforts of Black, Guildford, Molyneaux, Wilson and others at the time of the World's Columbian Dental Congress, little has been done to increase and enlarge our nomenclature, with the exception of some individual efforts. Individual efforts, while they may be praiseworthy and often productive of much good, inevitably lead to confusion in the use of several words to mean the same thing, and mainly serve to impress more forcibly the necessity for co-ordination of efforts to the desired end.

Any effort, however, to standardize our nomenclature should be made with a full consciousness of the desirability of conforming it as closely as possible to the general laws of nomenclature as already accepted by the biological sciences. The desirability of this course need not be even pointed out to this audience, nor is it necessary to intimate the enormous step thereby that would be made toward simplifying the elemental phase of our work.

There is a two-fold responsibility involved in the adoption of a scientific dental terminology. Terms must not only express their meaning with precision, but as in medicine many terms are used to express a relation to a pathological or other biological phenomenon. These terms must not only be correct in an etimological sense; they must be so coined as to have a correct scientific meaning, and those who originate them must not only possess the cultural fundamentals necessary to the science of nomenclature, but must also have a broad scientific vision, as well as an intimate knowledge of the subject in all its aspects. In fact dental nomenclature may almost be considered a specialty in itself.

If we may be pardoned a suggestion that we believe would, if put into practical operation, materially forward our purpose, it is that this body or a similar one be organized to functionate under the direction of and in collaboration with the National body to the end that our nomenclature may be controlled, directed and established through an authoritative source. There could well be established a permanent committee to whom all matters pertaining to nomenclature could be referred as well as for the consideration of any suggestions regarding the adoption of new words, and also regarding the desirability of eliminating not a few that have been proven valueless.

Dr. King in suggesting the direction in which our efforts be applied at this particular meeting asked that we submit a list of words for consideration. Realizing, however, the limitations of time that would



necessarily be imposed on this occasion, we have incorporated only a few suggestions in relation to some of our most apparent needs:

Dead tooth, devital tooth, devitalized tooth: These terms are correct when relating to the pulp, but are in no sense correct as above used. We suggest the term "pulpless tooth," which we find meets all the exigencies of the case except where there is a devitalized pulp remaining in the pulp chamber, and such a condition would call for a phrase rather than a concise term to indicate it clearly.

Acting on the suggestion embodied in the report indicating the desirability of conforming our nomenclature to that of the other biological sciences, we submit for consideration the use of canine, for cuspid; premolar for bicuspid; first molar for sixth year molar; second molar for twelfth year molar; and third molar for wisdom tooth.

Mandible for lower jaw and maxillae for the upper jaws.

Conduction anesthesia for conductive anesthesia.

Deciduous teeth for temporary, milk and baby teeth.

Periodontoclasia for pyorrhea alveolaris.

Pediadontia to indicate that branch of dentistry which has to do with treatment of children's teeth.

Radiograph to indicate the X-ray process and also as a verb. Radiogram the product of the process. X-ray to indicate the process but not used as a verb. We submit that the words skiagraph, skia-gram, roentgenogram, roentgenograph, shadowgraph, shadowgram, are simply contributory to confusion of words to indicate the same thing.

Apicoectomy rather than apectomy, or apicectomy, apico- being the proper adjectival combining form.

Cast for model. Our use of the word model is not in any way justified.

Alveclus as applied to the socket; not to express the alveolar process surrounding the tooth.

Dentural, adjective, relating to the denture.

Alveolectomy, excision of the alveolar process.

## A Plea for Moderation in the Wholesale Extraction of Teeth

BY ARNOLD E. GIBSON, D.D.S., PENN.

(*Read before the Odontological Society of Queensland.*)

IN making a plea for moderation in the condemnation and extraction of teeth, please do not interpret my remarks to imply that I am not a believer in focal infection of dental origin, or the utility of the X-ray in diagnosis. At the outset, let me say that I am a firm



believer in both; and a missing lateral in my own mouth proves that I had, at least, the moral courage of my convictions in an unsuccessful search for the cause of rheumatism.

For a considerable time the dental profession fought hard to get the medical profession to recognize the importance the oral cavity played in regard to the health of the individual. For years the medical profession exhibited an absolute disregard of the teeth as a factor in disease, until Hunter made his famous indictment against septic dentistry, and to-day the teeth are regarded as the most potent factor in the causation of most of the diseases that human flesh is heir to.

The medical profession (like the dental) is one of fads, and in this latest one I feel that the pendulum has already begun to swing back, and I trust it will not be long before the dental focal infection fad is placed on a saner and sounder basis, and whole sets of useful teeth will not be condemned to the forceps.

An infected tooth may, and undoubtedly does, cause some of the systemic disturbances frequently met with, but I consider the beneficial results obtained by the wholesale extraction of teeth highly problematical.

A wise Deity, in planning the human being, gave him dental arches containing thirty-two teeth, and we, as dentists, know that any interference with that number of teeth (with the possible exception of the third molar) lessens the efficiency of those arches, and, as far as this discussion is concerned, that is about the only statement that can be made with any degree of certainty.

A great many of our medical men at the present time are sending their patients along to have their teeth X-rayed, and on the findings ordering certain teeth to be extracted—a practice to be heartily condemned; as a dental radiograph, excellent as it may be, is often misleading unless backed up by clinical evidence.

Amongst the many diseases attributed to dental origin, I think rheumatoid arthritis holds pride of place, and although many authentic cures are reported solely due to the extraction of an infected tooth, is it not possible that once a joint is infected, that that joint will become a focus, and infect others, and it will be too late to effect a cure by the simple extraction of a tooth.

At the present time there is a small body of dentists known as the hundred-percenters, who do not believe that a non-vital tooth should be retained in the dental arches on account of possible infection, but to follow that argument to its logical conclusion it would be safer to extract all teeth as they erupt, and thus insure the unfortunate victim against all disease of dental origin.

A year or so ago Dr. Stengel, a noted physician of Philadelphia, uttered a note of warning against what he termed "the ruthless

slaughter of innocent teeth," and stated that every infection does not arise from an infected tooth; neither does every infected tooth cause an infection.

The latter part of that statement can be amply borne out by every dentist who did work in the military camps during the war. It would, I think, be a conservative estimate to say that 90 per cent of the men who went into camp suffered from an infection around one or more teeth, and yet all those men were passed as physically fit and free from systemic infection of any kind.

To my mind, this proves that it is only occasionally that an infected tooth causes systemic disturbances, and I feel that we, as dentists, would be justified in making an effort to retain in the mouth some of the teeth that are now condemned, even if the X-ray gave evidence that a root-filling was not absolutely perfect. Dr. Pierce Anthony ("Cosmos," November, 1920), in speaking of the radical trend of dentistry, says: "Much of the radicalism above referred to, has come from a misinterpretation of radiographic findings, and this valuable addition to our practice will eventually, we feel, prove to be one of the greatest advances made in many decades past; when we have arrived at the point where we can properly interpret our findings we do not believe they will point, as some seem to think at present, inevitably to the removal of every infected tooth. Too much reliance is being placed upon the X-ray film and its interpretation as the final diagnosis in all cases. It will eventually prove an invaluable adjunct to dental practice, but it will be as a diagnostic aid to clinical manifestations." In the same issue of the "Cosmos" Dr. T. G. Hinman remarks: "Experience has taught me not to depend solely on the X-ray picture as a means of diagnosis. It is the biggest liar in the world. Baron Munchausen was a pigmy compared with the X-ray. How do you know? you ask me, why it happens that I have been doing X-ray work for twenty-three years, and I believe that is a reasonable time in which to form an opinion, and I have come to the conclusion that of all things we have in our practice the X-ray picture is the most deceptive. . . . It is a part of the diagnosis, yet we take X-ray pictures and say upon examination of them, this should be done, or that should be done, never taking the other factors into consideration."

That the pendulum is on the swing in Australia I would refer you to an article by Professor Mills, of Sydney University, printed in March issue of "The Dental Science Journal."

In conclusion, I feel that many of the teeth that are now condemned on radiographic findings can be safely treated and filled, so as to remain a healthy and useful dental organ. The deciding factor as to what teeth may be retained should not be above the intelligence of the average dentist, and, in coming to a conclusion, the opsonic index should be carefully considered.

Before closing, I must enter my protest against some medical men prescribing "wholesale extraction" for their patients, as this should be the sole right of the dentist, and it behoves us, as dentists, to do our utmost to place this focal infection fad on a sane and sound basis.

-*Australian Journal of Dentistry.*

## Dentistry in War Time

### A MOVE IN THE RIGHT DIRECTION.

BY GEORGE CECIL.

[*The author describes something of Dentistry as practised in the British Army. Canadian Dentists will naturally make favorable comparison between the B.E.F. Dental Service and that supplied Canadian soldiers through the Canadian Army Dental Corps.*]

IT was said that during the South African War almost as many men were incapacitated owing to defective teeth as owing to wounds, the British War Office having, with brutal indifference and criminal lack of forethought, omitted to send out a corps of dental experts. Officers and men alike had to submit to the clumsy ministrations of ignorant Royal Army Medical Corps doctors, or to endure their aches and pains as best they could. Fortunately for the health of the troops, during the recent war, the "advantages of the Army" included a number of skilled dentists, who served in every country in which fighting took place. The majority, however, were to be found in France and Belgium, both at bases and at more advanced stations.

In the earlier stages of hostilities the question of the soldiers' teeth did not interest the authorities. To entrain, and embark regiments, batteries, stores and so forth, was all that mattered. But after a few frenzied months, when Lord Kitchener's "three weeks or three years" had been forgotten and when the war office realized that "it may be for years and it may be forever" was nearer the mark, the authorities bestirred themselves and members of the dental profession were invited to serve.

### THE MAGIC WORD "MAJOR."

To a young man, scarcely out of his apprenticeship, and whose prospects of making his fortune were none too rosy, there was considerable inducement to comply with the offer. The pay and allowances being fairly good, the dentist could save money, and if he saw no actual fighting, the change of scene, at least, enabled him to rub shoulders with the world and to expand his ideas and consequently to improve his mind.

The dental surgeon also enjoyed the distinction of ranking as an



officer, or rather a temporary officer, his first commission being that of second lieutenant, while he speedily rose to the rank of lieutenant, eventually becoming a captain. Here the aspirant for military honors stopped. Much as many would like to have written the magic word "Major" after their names, the hard-hearted powers-that-be declined to humor them. Indeed, those who held in their hands the destinies of the Corps of dental officers at one time were in two minds as to whether they should be allowed to wear a uniform. However, it was argued that if the Ordnance, Pay, Chaplains and Veterinary Departments were permitted the privilege of disporting themselves in khaki, it would be ridiculous to withhold it from the dentists.

So each received his money for kit allowance, ordered a complete paraphernalia and prior to crossing the channel was photographed in field service jacket, breeches, gaiters and Sam Browne belt. Thus was pride gratified.

#### DISILLUSIONMENT.

Upon arriving at their destination, the officers of the newly formed Corps had to face disappointment. In the first place, many of the temporary R.A.M.C. officers, instead of welcoming the newcomers, looked down upon them. This was both snobbish and foolish, for socially the dentists were the equals of the doctors, in many cases being of far better birth. But matters eventually adjusted themselves; the toughest and roughest of the R.A.M.C. medicos, as well as the most exclusive regular officers, making themselves agreeable (you see it is not safe to affront the dentist—he may hurt you in return).

The next disappointment was the distance between the dental surgery and the firing line. To a high-spirited young man, who burned to see service, it was galling in the extreme to hear the guns booming thirty miles away and never to see anything more exciting than the searchlights when night attacks by aircraft were expected. They saw the long string of ambulances come in daily and they could gaze to their fill upon detachments of "walking cases" making their way to the hospital. Of the fighting actualities of war, however, the dentist knew little or nothing—mostly nothing—unless an army or corps headquarters sent for him to extract a suffering general's much neglected and aching tooth. The dentist then ran the risk of being shelled both going and returning; and should he have succeeded in pleasing the eminent "brass hat" upon whom he had attended professionally, he might, by special favor, be allowed to visit the trenches.

Meanwhile, if the dentist, like most people, had his troubles, the job yielded certain compensations. For in the intervals of operating he learned much of interest from his patients, and the information thus gained made him a welcome guest at officers' messes which hankered after the latest news. Indeed, several members of the corps owed their promotion to the atmosphere of interest with which they sur-



rounded themselves. One or two, in fact, became so indispensable to staff officers whose hands held many favors, that they were made to accept the Order of the British Empire, a singularly undistinguished distinction, the ribbon of which a gentleman seldom cares to wear. In the B.E.F. it was bestowed upon notoriously useless officers for less than the most trifling services, while in England music hall performers and other persons of the same kidney were awarded it.

#### ROUGH AND READY.

A considerable amount of nonsense was published in certain English papers about the perfection of the military dental arrangements. As a matter of cold, calculated fact, they were very far from being perfect. At the beginning of the war much could be pardoned; shortcomings earned forgiveness. But both at Lille and Rouen military hospitals, as late as the spring of 1919, the dental surgery was not provided with any sort of anaesthetic. The unfortunate patient was expected to have every tooth in his head extracted under the same conditions which prevailed in the earliest days of dentistry. It also may be noted that during the first four years of hostilities the dentists were so few and so overworked that many a tooth which might have been saved was sacrificed to time, though later on—when circumstances permitted—a vast amount of crown and bridge work was got through. Nor were there sufficient relief posts. Calais and the surrounding camps shared but one dental surgery, and sufferers in need of relief had to walk from three to twelve miles (according to where they were stationed) to be attended to ten days after applying for an appointment. The Calais Base, by the way, was without exception the worst base in France. The interests of all ranks were neglected in a manner of which a callow Second Lieutenant would have been ashamed. And its Base Commandant was a Major General.

In several stations the dental surgeries were modelled on a quack's caravan at a fair; but every base hospital could boast of a well-equipped dentist's establishment fitted with all the latest instruments and devices known to dental science. The operators, too, were highly skilled, though it must be confessed that in the matter of extractions they were not always kind to the unhappy patient. The present scribe, had occasion to present himself before a dental surgeon, an uncouth Scotchman. "Can I have an anaesthetic?" "Na, ye canna'." "Forgive the trouble I am putting you to, but I hate being hurt unnecessarily!" "Oot comes yer tooth, or oot ye gang. I've no time to waste wi' ye." It would be interesting to know if this practitioner is a success in his post-war practice? One imagines that slaughtering cattle, or playing football, would be his proper occupation. Happily for the credit of the Corps, this undesirable type was in a minority.

In stations where the attendance at the dental surgery was abnormally large, extractions were performed without an anaesthetic as a matter of principle. "If I give them a whiff of gas, or an injection," casually remarked a young and hardened lad who had passed his examination a month previously, "they go and tell their pals that it came out without hurting. So as time's valuable, I just yank it out without." Not saying much for the "advantages of the army."—*The Canadian Military Gazette.*

---

### Dental Quotations From Cliff Goldsmith's Calendar

---

One good tooth deserves another.

Brush the teeth at least once a day.

Brush your teeth as well as your shoes.

Eat your crusts, or you'll lose your tusks.

A hole in the tooth may mean a hole in the mouth.

Brushing the teeth twice a day won't wear them away.

The dentist may not be your best friend, but pay him a regular visit.

Just the exercise of cleaning the teeth every day will work up an appetite.

The ivory pickets on the gate to your stomach should be polished every day.

A chicken has a gizzard instead of teeth. Don't get the idea you're a chicken.

Sixty per cent of the United States need dental attention. And the remaining 40 per cent of us also need it.

---

### Calgary School Dental Officer

---

THE Board of Education of Calgary, Alberta, desires to communicate with a young Canadian Dentist interested in School Dentistry and desiring to engage for full time service in School Dental work.

---

CEMENTING AN INLAY.—In cementing a gold inlay, malleting the inlay by using a stiff strong orange wood stick will give excellent results in seating inlay. This method is followed by rigid burnishing and finally having patient put full strength of muscles in closing teeth after a piece of orangewood about one-eighth inch long and squared on all sides has been placed on the inlay. This throws full pressure on the inlay, tending to drive inlay further to place and overcomes any possibility of heaving while cement is crystalizing.—*W. D. N. Moore, Chicago.*



## After the Vacation

VACATIONS are the breathing spots of a panting humanity. We go at such a rapid pace these days that we would fall exhausted if we did not let up at times, and give the straining nerves, and muscles, and blood vessels a chance to relax. The best description of a vacation I ever heard was from a gentleman of large interests who had been away from home for a few weeks, and when asked where he had gone, he said: "I have been down to the seashore to *unwind*." That is precisely the process when we go away on the right kind of a vacation. During the rest of the year we are so incessantly occupied with the high-tension duties of the day that we get keyed up to a pitch that is abnormal, and unless we unwind occasionally, and let the machinery recover from the stress, something will eventually break.

But the hard part of a vacation is immediately after. One would think that the rested tissues would leap to their work with a vim and zip that would make the heaped up duties melt away, and there are some men who seem to be able to do this. But with most of us the first few days are a drag, and the machinery does not run just right. It seems to require time to get it tuned up again so it will move smoothly, and without more or less friction. For this reason one is sometimes disposed to doubt that a vacation is as beneficial as has been supposed, and yet the truth is that the chief benefit from a vacation frequently comes some time after. If we but have patience and work away faithfully, the rhythm will come eventually, and we will acquire a zest for our work which makes it a real pleasure. And oh, the joy of doing things when we have once "hit our stride," and are able to make every move count. There is no satisfaction in life quite equal to that of being able to add something of real value to the sum total of human achievement each day, to see men made more comfortable and happier as the result of our ministrations, and to feel that we are an integral part of the great human machinery that makes the world a better place in which to live.



To be a nonentity in life would seem the worst calamity that could befall a man, and yet no one need be a nonentity—however limited his ability may be. Every man is given sufficient talent, if he only applies it to the best advantage, to accomplish something of merit in the world. It may be only to build the best mousetrap, or to make a cubic yard of earth yield more than some other cubic yard. No matter what it is, if he accomplishes something for the welfare of the race he is no longer a nonentity.

It may require more application in one case than in another, and yet with few men does achievement come without application. Long-continued hard work is the surest road to accomplishment of any kind, and the reason men are working so incessantly to-day is because they have learned this fundamental fact. The geniuses who can arrive at results by the short cut are very rare. Few things are done by the inspirational method—most are done by patient plodding—otherwise plodding would not be the order of the hour. There are more men relatively to our population who are working hard to-day than ever before—more men who apply themselves incessantly to the task in hand, and, therefore, more is being accomplished than in any age since the history of man began.

This is why men have to stop working at times to catch their breath—why the vacation has become an established institution in the land. We achieve more in the ultimate because we take vacations, and store up the energy which enables us to run at top speed in the intervals. Let us not be discouraged if, when we return from a vacation, we do not at once strike our accustomed gait and make the pace we have set for ourselves. The pace will come if we patiently work for it, and when it does come we shall be able to maintain it better because of having taken the rest and renewed our energy. A vacation is not a mistake—it is a necessity.

*C. H. Johnson*

---

### Michigan Dental Examination

---

THE next Examination for candidates wishing to practice Dentistry in Michigan will be held in Ann Arbor during the week beginning November 14th, 1921. All credentials and fees must be in the hands of the Secretary not later than November 4th. For application blanks write to E. O. Gillespie, 745 David Whitney Bldg., Detroit, Michigan.

E. O. GILLESPIE, Secy.-Treas.



# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, SEPTEMBER, 1921

No. 9

## EDITORIAL

### Canadian Army Dental Corps

THE Canadian Department of Militia and Defence has issued an Order-in-Council regarding the administration of the Canadian Army Dental Corps, as follows:

"(7) The Canadian Army Dental Corps will be administered by a Director of Dental Services, under the Adjutant-General at Militia Headquarters. He will also be responsible for the proper conduct of the Dental Stores, Militia Headquarters.

"The Director of Dental Services will receive an annual retaining fee of \$500, and in addition will have the option of himself performing any or all of the Dental Work for the personnel of the Permanent Staff and Force stationed in Ottawa.

"(8) In each Military District in which combatant Permanent Active Militia Units are stationed, an officer to be known as the 'District Dental Officer' will be appointed from the Dental Detachment of the District, or from the Corps Reserve of such Detachment.

"The 'District Dental Officer' will administer the Dental Services in the District, including dental service for the Permanent Active Militia stationed in the District, in accordance with the existing regulations.

"The District Dental Officer will receive an annual retaining fee of \$250, and will be granted \$2 for each recruit he dentally examines for the Permanent Active Militia. This examination will not take place until the recruit has passed his medical examination. In addition he will have the option of personally attending to all dental cases of the Permanent Force in his District."

This Order-in-Council appears to settle the long-standing discussion as to whether the Canadian Army Dental Corps should be permanently organized as a separate unit, or be a part of the Medical Corps. The principle of a separate corps has been adopted, and provision has been made for a Director of Dental Services, as well as a District Dental Officer in each Military District.

There will doubtless be disappointment in the Dental Profession that the Director and District Dental Officers are not employed for full time service, and that the dental needs of the Permanent Staff and Force are not to be systematically cared for by the Government.

However, in spite of these weaknesses, we believe that on the whole the Dental Profession is to be congratulated that the wonderful work accomplished by the C.A.D.C. during the war has made for the Dental Corps a permanent place as an independent unit in the Militia of Canada; and, with a wise choice of personnel, the work of the Dental Corps will develop and prove itself to be as efficient and vitally necessary in peace as it proved to be in time of war.

---

### More Frequent Consultation

---

THE first concern of both medical and dental practitioners should be "service to the patient," and the best possible service in many cases means frequent consultation and cordial co-operation covering both pathological and physiological phases of the case.

A prominent internist, who has devoted considerable attention to dental infection and systemic disease, and who might be fairly regarded "a hundred percent" in his attitude toward dental infection, stated that the more he associated with dentists, and the more he conferred with them in the interpretation of dental radiograms, the less dogmatic he became in his own judgments. The interesting question is, just why should he, as a physician, have been dogmatic at any time in his opinions regarding the teeth and surrounding parts?

We need, in the interests of our patients, more frequent consultations between physicians and dentists, and we also need more frequent consultations between the members of the Dental Profession themselves.

*“Don’t worry because the  
tide is going out.—It al-  
ways comes back.”*



OFFICERS, EXECUTIVE COMMITTEE AND CLINICIANS AT THE JOINT POST GRADUATE MEETING OF THE  
WASHINGTON, OREGON AND BRITISH COLUMBIA DENTAL ASSOCIATIONS.

VANCOUVER, B.C., JULY 11TH TO 16TH, 1921.

Top Row—C. J. Stansbery, I. Lester Furnas, Jos. A. Pollia, C. H. Gatewood, Wallace Secombe,  
Arthur E. Smith.  
Middle Row—Rupert E. Hall, W. J. Lee, J. M. Jones, A. T. Oberg, E. C. Jones, Hugh Avary,  
T. W. Sulpes, George A. Sulbeck, J. F. Alexander, W. J. Bruce,  
Bottom Row—Frank P. Smith, R. L. Caldwell, T. R. Fedeh, J. F. Alexander, W. J. Bruce,  
Chas. A. Furrow, T. W. Maves, A. W. Ward, F. H. Van Dervoort.



# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, OCTOBER, 1921

No. 10

## Some Things a Dental Practitioner Should Know About Orthodontia to Best Serve His Patient

C. ANGUS KENNEDY, D.D.S., TORONTO.

AS the heading of this paper signifies, it will be a talk with the general practitioner who lives in a city where he has the opportunity of conversing and consulting with an Orthodontist.

There have been so few chances for him to receive any instruction in this subject, on account of so few essays appearing in our magazines, or such topics being so seldom on the programme of any of our Dental Society conventions.

The first step in this line would be to take care of the health of the patient and see that his nervous system would be able to stand the duration of treatment. As some cases are long, the history of health should be thorough and, where necessary, advice given to the patient.

The practitioner should have a knowledge of the development and growth of the tooth, the alveolar process and pericemental membrane, the characteristics and functions of the bone cells in tearing down and rebuilding of bone and tissue, the development and normal use of the muscles of the face and jaws, the disuse and abuse of these same muscles and the resulting malocclusion. These results are often the cause of the growth of adenoids and nasal obstructions, which in turn cause mouth-breathing. Through lack of proper instructions the child is allowed to continue in this practice, producing a great malocclusion, facial deformity, and pathological conditions of the respiratory tract.

We see these patients from afar—thin, sallow cheeks, undeveloped upper lip, protruding upper anterior teeth, narrow-chested, and a general appearance of being poorly nourished. These symptoms

belong to the mouth-breathing habit, and are started by the patient not being able to breathe through the nose on account of adenoids or nasal obstructions.

The respiratory tract should be examined by a Rhinologist, to clear the passages. After this has been accomplished, the lips should be held together at night by adhesive tape, or some such appliance, until the habit is broken and the patient is breathing in a normal manner.

Another habit is that of tongue or finger sucking, which is very hard to overcome, and which produces an infraocclusion, the patient being unable to bite anything with the anterior teeth.

By studying the eruption period of the temporary and permanent teeth, the general practitioner should know when to extract and when to leave alone. In deciding this point he should be sure of his diagnosis, and also be able to give a good prognosis of the case. The extraction of temporary teeth too early will allow the remaining teeth to drift, closing the space for the permanent teeth following. Also, the extraction of the first permanent molar is a dangerous operation, as it allows the second molar to tilt forward, causing the incline plane to occlude in a mesial position, and forcing the opposing jaw into malocclusion. In fact, the extraction of teeth for the correction of malocclusion should be studied very carefully, as a couple of years afterwards a much greater deformity may take place as a result of the extraction.

A thorough knowledge of the causes of the promotion and delay of eruption, such as syphilis, rhinitis, tuberculosis, is also very necessary.

In speaking on this subject it should be impressed upon all practitioners that we should have a good idea of what correct occlusion is, and what it stands for, as malocclusion is only recognizable as being away from normal occlusion. This is one of the first requisites for giving a good diagnosis, and we cannot give proper treatment without the knowledge of the fundamental principles. It is absolutely imperative that we be able to correctly diagnose malocclusion before we can hope to successfully treat it. It is necessary to know the relationship of every tooth, cusp, and incline plane of the teeth of the mandible to the teeth of the maxillæ.

Malocclusion of the teeth is not inherited. The child inherits characteristics from the parent, but the influence on malocclusion is limited to the environment of the child, whether it be in its embryonic state or after birth.

Under modern methods of living, a very large percentage of babies are bottle-fed. Aside entirely from the vital necessity for the babies' food being so prepared as to contain a "balanced diet" during this

important period, it is essential that the child find it necessary to thoroughly exercise the jaws at the time of feeding.

The baby should be held in the arms in the posture as for breast-feeding, and the bottle so held that the child is compelled to work for the food. A most pernicious habit is that followed in many cases where the bottle is propped up and a nipple used permitting such free flow of food that practically no effort is required on the part of the child to obtain the food.

Food and exercise are the most important elements in the proper development of the dental arches, and my plea is that the advantages of thorough mastication be not overlooked, even in the case of the very youngest child.

One should have a good working knowledge of the above events in the life of a child to be able to give a good diagnosis and information to the parents. A physician, in being called to the bedside, gives a thorough examination and diagnosis of the symptoms as he sees them, and gives his patient the result of his deliberations. This advice might be for consultation with a surgeon or specialist, or for an operation. The result is that the patient is receiving the best advice and services which are possible. Our consultations should take place early in the life of the child, so that the Orthodontist would not have to wait until the permanent teeth are all in position before starting a long case. The Orthodontist needs the hearty co-operation of the practitioner all the time, and if we could work in closer touch and together, the patients would all be benefited. An example of this was brought to my attention a few weeks ago, when one of our best practitioners had inserted an inlay in a bicuspid for a patient who was also under the care of an Orthodontist. He thought he had a very good result in the inlay. The grooves and marginal ridges were in good condition, and he had splendid occlusion. The Orthodontist said that the mesio-distal diameter of the reconstructed tooth was not wide enough, and that the inlay should be  $\frac{3}{100}$  of an inch longer, so as to keep the correct occlusal line.

The consultation which afterwards took place between the practitioner and the specialist was very beneficial to both, as each saw the oral cavity from the viewpoint of the other, and the result has been an education and a great help to both, the specialist pointing out the phases where his difficult work can be assisted by the practitioner, especially in the case of extractions, carving cusps for fillings and inlays, and permanent restorations for retaining appliances, and the practitioner explaining his features of the case.

If we as a profession are going to render the greatest possible service to the public, there must be closer co-operation between the Dentist and the Orthodontist. There are many difficulties which we have to overcome, and by working together the patient is bound to



benefit, and the oral cavity of the child will be set in a healthy and normal condition. Often we who are spending all our time in trying to get efficient results have some hard problems to solve, when a consultation would help materially.

There has been a tendency in the past for the two branches of Dentistry to drift apart, instead of combining their efforts.

There is a great field for the general practitioner in the new department of Preventive Orthodontia. He comes in contact with the child before the Orthodontist, and could prevent numerous cases from developing into severe cases of malocclusion.

He should know occlusion and be able to recognize irregularities in a developing mouth; also that the time to correct any malocclusion is as soon as the tendency manifests itself, not waiting until the patient is older, or until all the permanent teeth are in position. The case should be completed by that time, instead of just beginning.

When a young patient is found to be a mouth-breather, he should look for the cause along the respiratory tract; or when a temporary tooth is remaining in position too long, and thereby causing the permanent teeth to erupt in a malposed position; or when a child is not developing the normal separation spaces between the anterior teeth, showing the jaw to be expanding and nature making preparation for the reception of the large permanent teeth; if he would send the patient for a consultation with an Orthodontist, their combined judgment would result in better service to the patient.

It takes a long time and special study to properly diagnose and pass judgment on the treatment of orthodontia, and the Dentist often to-day overlooks conditions that to-morrow may prove to be a most severe malocclusion.

Dr. F. B. Noyes says: "It should be the Dentist who would send patients to seek the services of the Orthodontist, and if the Dentists were alive to their responsibility, and were sufficiently informed to recognize the existence of malocclusion before it developed into deformity, it would be better for all concerned."

In conclusion, would say that the closer the relation concerning consultation between the Dentist and the Orthodontist, the better it will be for the Dental Profession and the general public.

---

CAPPING MATERIAL WHERE THE PULP IS ALMOST EXPOSED.—Take equal parts of zinc oxide and thymol and melt together in a spoon. When cold it sets hard. Break into small pieces, and place in an air-tight bottle. To use, place a small piece over or in the deep part of the cavity, and just touch it with a warm burnisher. It will then melt and flow over the base of the cavity.—Gordon C. Barkley, D.D.S., Sydney (*Dental Science*).



## Danger Signals in Nitrous Oxide Oxygen Anaesthesia\*

DR. E. ROY BIER, WINNIPEG.

ALL attempts to cover the Nitrous Oxide and Oxygen administration in so short a time would be time wasted, and so I will not detain you, gentlemen, very long, but will endeavor to point out the danger signals, and how to overcome them, as well as to throw some light on a few relative points.

The father of skill is industry, and anyone desiring to become an Anaesthetist may do so, provided he keeps at it, working industriously to understand the normal and abnormal symptoms and learning to differentiate between them.

Nitrous Oxide and Oxygen Anaesthesia is so rapidly induced that, unless you can positively understand when overdosage for that particular patient has started, death may result much more rapidly than by using any other anaesthetic.

The Committee on Research of Anaesthetics in the U.S.A. brought in this report: that Nitrous Oxide and Oxygen was the safest anaesthetic agent in the world at the present time, in competent hands, and the most dangerous agent in the hands of the incompetent. To-day in Winnipeg, not half a dozen medical men in the city are allowed by the hospital boards to administer it for major operations. Just recently, when I had my appendix removed, I took Nitrous Oxide and Oxygen. I told the superintendent what anaesthetic I preferred, and was told that only one man in that hospital was allowed to administer it. I then made enquiry why so much caution in the use of Nitrous Oxide and Oxygen, and they said it was due to past accidents with Nitrous Oxide and Oxygen, and its difficulty in administration. Surely, then, the danger signals are far the most important I could speak of.

First of all, use a pure gas—tested by a reputable chemist. Then before using each new cylinder, smell the gas and see whether it has the sweet, pleasing smell of Nitrous Oxide or a sharp pungent smell of impurities which may be due to an unwashed cylinder or a trace of chlorine or nitric oxide.

Use a machine easy of manipulation, and one where percentages are controllable by a definite knowledge.

Use Oxygen from the start of the anaesthetic with all patients, except plethorics, varying the percentage according to the needs of the patient. This will oxygenate the circulation and the tissues, as well as the respiratory organs, and death from asphyxiation is

(\* Read before the Winnipeg Dental Society, March, 1921.)

not apt to happen nearly as rapidly. One should be able to recognize:

1. Heart lesions and circulatory disturbances, also take blood pressures.
2. Respiratory disturbances. Look for:
  - (a) Enlarged tonsils.
  - (b) Hypertrophied polypii.
  - (c) Swollen mucous membranes.
  - (d) Tuberculous condition.

The sound of the breathing should be so familiar to the Anaesthetist that he would almost be able to look out of the window and tell what stage of anaesthesia his patient is in from the sound of the breathing. The more nearly it resembles a natural sleep with a faint snoring sound, which is due to the vibration of the soft palate, the nearer perfect is your surgical stage of anaesthesia, and any deviation from that means a deviation from the normal or perfect anaesthesia. Very shallow, light breathing, hardly noticeable, means one of two things,—over-narcosis, approaching very dangerous stage, or under-narcosis, coming out of the anaesthetic. If your patient is overdosed, no doubt, cyanosis will be present. Remove the inhaler immediately, shut off all Nitrous Oxide, and administer Oxygen, if necessary. If the color is very pink, in all probability the patient is coming out of the anaesthetic, and you must shut off the Oxygen and more deeply anaesthetize the patient.

If pale and sweating, remove inhaler and give Oxygen. All questions of focal infections to-day are just a question of dealing with the longevity of our patients (their health and comfort, of course, contribute to their longevity), and every time one gives a general anaesthetic we are dealing with the life of that patient. No matter what contribution our skill and work in whatever branch of dentistry we are engaged in, we are dealing with health and comfort of the patient, and for these gifts of skill we should in return command the respect and remuneration of our patients according to services rendered.

Over-narcosis means destruction of haemoglobin and the erythrocytes. Casto, of Philadelphia, has shown the destruction of red blood cells to be as much as 16 per cent. from overdoses in major operations. His experiments were done on animals, as well as man.

Destruction of red blood cells means the system of the patient is so much weaker. These red blood cells have to be replaced and again manufactured and placed in the blood streams. That patient has not as high a resistance to fight against disease, and post-operative recovery is lowered. However, that destruction of red blood cells can be largely overcome by using Oxygen from the start of the administration and keeping the patient in normal anaesthesia. Warming

the anaesthetic agent is also a safeguard toward danger of producing undue excitement which is at times caused by a cold agent, which irritates respiratory passages and reflexly irritates the brain, causing excitement.

In experiments on animals with cold anaesthetics, death was accompanied by convulsions. Similar experiments with warm anaesthetics showed death was more tranquil.

Lung hemorrhages in tubercular patients may be avoided by using a large percentage of Oxygen and warming the Nitrous Oxide during administration. It has been proven that warm Nitrous Oxide is less irritating to mucous membranes and causes less swelling, less stimulation to salivary glands, less mucus, hence less nausea.

**Warming the agent.** Warm gases at body temperature are more normal, and pre-existing gastro-intestinal disturbances are often prevented, because acidosis and cellular changes are entirely eliminated. This, therefore, lessens the danger of after effects and removes the danger of anaesthetic shock, and is considered a safeguard of life generally.

Recovery from a warm vapour is much quicker during prolonged anaesthesia than from a cold vapour.

Gwathmey says experiments on humans result in rapid recovery by passing warmed air into the lungs after ether anaesthetic or any anaesthetic, and putting hot towels about the patient's face, and delayed after effects are reduced to a minimum.

*Rebreathing* is a very important factor. 1. Acapnia\* results from the lack of rebreathing, which means a loss of Carbon Dioxide in the blood. Carbon Dioxide is the normal respiratory stimulant, and when an open method is employed the Carbon Dioxide is lost.

Henderson has been able to reduce animals to a state of shock by over-ventilation and getting rid of Carbon Dioxide in the body.

*Rebreathing*—2. Lessens post-anaesthetic vomiting. 3. Decreases the number of cases of abdominal distention. 4. Reduces post-anaesthetic lung complications. I have anaesthetized 2,000 cases of lung complications, bronchitis, pulmonary T.B., empyema of the lungs, without hesitation, and only two cases had any reactions, and no deaths occurred.

Deaths under anaesthesia from Alcoholics precipitate in the following symptoms:

1. Ascending degree of cyanosis.
2. Increased excitation.
3. Tonic or clonic spasms of the musculature, with embarrassment of respiration, asphyxia and abrupt cardiac arrest.

---

\*Acapnia only develops in long anaesthesias.

4. Over-ventilation, acapnia, pallor, apnea, gradual cardiac exhaustion.

Alcoholics and dope fiends are bad risks, as chronic alcoholism, according to Dr. Mechan, causes the following pathology:

1. Anterio Sclerosis and Cardiac Hypertrophy.
2. Increased inter-cranial pressure and edema of the brain.
3. Cirrhosis and fatty degeneration of the liver.
4. Increases susceptibility to post-operative infection.

The men who achieve success are those who have worked, thought and read more than is necessary, who have stored knowledge for an emergency reserve. It is superfluous work that equips a man for everything that counts most in life. The art of anaesthesia is not contained in any one man's teaching of a certain method of administration; it is the knowledge gathered with the skilful observation of human reaction to different anaesthetic agents, and a broader sense of mental and physical equilibrium of the patient. The art of anaesthesia is an intuition developed by experience.

Much of a psychic fear of a patient depends upon the confidence or lack of confidence a patient places in the anaesthetist, and when a patient so lacks confidence, that is the first step towards the production of shock.

Blood pressure is important because it gives early warning of the presence of shock. It may uncover: Asterio-sclerosis, Nephritis, Myocarditis, Aortic insufficiency, Mitral Stenosis or anaesthetic depression.

Premedication absolutely advisable for above.

### *SHOCK.*

*Surgical*—Manipulation by surgeon, loss of blood.

*Anaesthetic*—Overdosage or too light anaesthetic, or obstructed airway.

*Psychic*—Due to the powerful impulses from highly specialized centres of the cerebrum acting upon the vital centres of the medulla.

*Dietetic*—Due to preliminary fasting before and after operation, abdominal cases.

*Toxic*—Abscesses with pus running down throat, absorption of chemical irritations reflexly. The patient requires larger doses of Oxygen or withdrawal of anaesthetic and cessation of operation. Fall in blood pressure always precedes shock by several minutes, sometimes as long as half an hour in ether narcosis.

*Anoci-association*—(Use of general and local anaesthetics—to obtund sensations from reaching the brain)—Preliminary medication of narcotics, morphia or chloretone to keep patient from any emotional excitement. Not to allow patient to worry about the date or time of operation, have patient put into hospital, give Nitrous Oxide to them while they are asleep, then use local anaesthetic and



block the field so completely that no traumatic (cutting, stretching or pulling) impulses reach the brain. After the wound is closed again block with a local anaesthetic of Quinin-urea, preventing after pains for twenty-four hours. Thus the motor mechanism has received no adequate stimulus, and there is no surgical shock, no interference with digestion, no nervous impairment afterwards, no change in the circulation, respiration, digestion or the mentality of the patient.

Respiratory paralysis is caused by:

- (a) Blood clot in throat.
- (b) Swallowing tongue.
- (c) Pieces of tooth.
- (d) Throat packs.

Precautions:

- (1) Keep open airway.
- (2) Mechanical forcing of oxygen into lungs.
- (3) Throwing forward of mandible keeps open airway and reflexly stimulates the nervous system, maintaining anaesthesia.

(4) Massage abdomen over viscera from pelvic region upwards. Internal abdominal pressures, enemas, opening of sphincter muscles.

5. Artificial respiration.

6. Inversion—

- (a) lowering head.
- (b) complete inversion.

Keep blood in brain, so as not to produce an anaemic condition of respiratory centre, thereby prolonging the action of respiration. Swinging should be done vigorously.

*Inversion*—Grasp by the knees and swing to and fro. This distends the heart and intercranial vessels. Also, the diaphragm presses down, producing a larger air space, causing a vacuum and the A.T. pressure of  $14\frac{1}{2}$  lbs. per square inch. The outside air rushes into patient's lungs. Swinging may force it out, then we have a mechanical bellows which will keep up respiration if our airway is clear to allow the passage of air into the lungs. If airway is blocked, have the assistant pound the patient on the back while you are swinging the patient. If you cannot obtain open airway, stretch sphincter muscles of ani, and swing in inverted position. If this does not produce results, do a Tracheotomy.

7. *Drugs*—

- (a) Camphor and oil.
- (b) Whiskey.
- (c) Aromatic Spirits of Ammonia.
- (d) Amyl Nitrate.
- (e) Units of Strychnine, etc.

## Leakage of X-Ray Tube Shields

JOHN W. CLAY, D.D.S., CALGARY, ALTA.

IT is only in the last three or four years that the dental profession at large has come to realize the value and necessity of radiographs in routine practice. The introduction of the small dental X-ray unit by manufacturers has been of incalculable benefit to the profession. The combination of Coolidge tube and induction coil has made possible a reasonably priced machine, which gives good results in the hands of more or less inexperienced operators.

As a matter of fact, the beginner soon produces skiagraphs of more value than any he can get from an outside source. He knows from clinical observation which parts of the mouth to concentrate on, taking pictures that overlap each other and from different angles. It is also very little trouble, and the patient does not feel a reflection on anyone's ability, if it is necessary later to obtain other or better views of any particular areas. The usual ten films made for the operator without clinical examination almost always place before the diagnostician the alternative of making one or two broad guesses, or of asking for a repeat of certain films.

Since this type of machine has come (and come to stay) in many dental offices, it behoves us to look for possible defects in the machines we are using. It seems to be generally stated by manufacturers that operators do not need to use lead screens while making skiagraphs, claiming that the leaded glass shield covering the tube is sufficient protection. It is claimed that no rays escape except those that pass through the orifice which is pointed at the part to be pictured. The operator is, however, cautioned not to stand so that any rays from this orifice can fall on himself.

That this is the only point of exit is, in most cases, (if not in all) a misrepresentation. The writer has examined several types of machines and found that all of them leak primary rays at one point or more. Either the parts of the leaded glass cover do not come together, or the point of passage of the cathode terminal of the tube through the cover is unprotected.

A test may easily be made. Take an unexposed film and place on it a couple of crossed pen nibs held in place by an elastic. Light your tube and look it over for possible leakage of rays. If there is a small space between the two parts of the leaded glass, as the rays come out from the target slightly diverging, the film should be held a couple of feet or so away from the tube, being careful to get in line with the band of rays which escape. A couple of inches to one side

or the other will give a negative result. With other types of tube shields, with the leaded glass all in one piece, there is usually a large U-shaped space at the cathodal terminal through which the primary rays escape, while secondary rays reach the operator from the whole uncovered portion.

The accompanying reproductions of skiagraphs made with different machines, by the method described above, show that there is more than a negligible quantity of primary and secondary rays passing through these unprotected openings. (Fig. 1.)

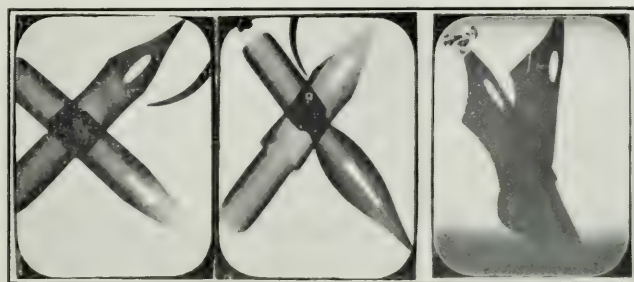


Fig. 1  
Films exposed for twice the operating time  
of machine used. Distance about  
two feet.

Fig. 2  
Film placed on top of cabinet.  
Tube adjusted so that  
leakage strikes film.

The amount of exposure on the part of the operator is of no importance in the taking of a few films, but occasionally it is necessary to make thirty or forty or even more exposures in one day. The effect of the rays is cumulative, and at the end of fifteen or twenty days, if the operator happens to have stood in such a relation to the tube that he is frequently opposite the leak, he will have received a fairly large dose. It would be difficult to estimate the amount of exposure, as there is a wide variation in the machines and in the relation of the operator to the escaping rays. There is little danger of a skin burn, due to the rays not always falling on the skin at the same place, but it is quite possible for systemic effects to develop in those who are susceptible. There is no doubt that the operator should not be exposed to these escaping rays from day to day over a period of months, as is frequently the case.

Though the effect on the operator is problematical, the effect on the unexposed or exposed films not enclosed in a lead box may be easily judged. It seems to be the custom with some operators to place the films after exposure in an envelope or loosely on the top of the machine until the whole group is exposed. If the leaking rays are turned in the direction of these films, more or less fogging occurs, with very poor or useless skiagraphs as a result. (See Fig. 2.)

If good work is to be obtained, with safety to the operator, these leaks must be stopped. The writer would recommend the use of

leaded rubber (as obtained from the surgical supply houses) to cover all points not protected by the glass. Sheet lead should not be used, as static electricity may be accumulated and passed on to the operator when adjusting the tube. The use of this additional covering tends to prevent radiation from the larger tubes, but this is not an objection where the tube is not used continuously.

For the two-piece shield with a space between, one part should be removed and an outline drawn on a sheet of leaded rubber to correspond with the edge of the leaded glass. The material can then be cut out and a rubber gasket is produced, which is held firmly when the tube is put back into place.

---

### Some Notes on Interpretation in Oral Radiography

---

BY R. S. PENNYCUK, B.D.Sc. (MELB.), L.D.S. (VIC.).

---

**I**T is my intention to make the matter of interpretation the main portion of my brief paper to-night, but, as many of you are unfamiliar with X-ray apparatus and the manner of X-ray production, I will attempt as a preliminary to give some idea of that phase of the subject. The necessary brevity I will make my excuse for the many omissions and some lack of clarity.

The term "ray" is used to designate two distinct types of phenomena. The first, a projection of small particles of atomic disintegration as alpha and beta rays; the other refers to the transfer of physical effects by the agency of wave motion. In this class we have light, gamma and X-rays.

The production of X-rays is a very complex physical process. To understand it we must accept the electronic theory of matter. The modern concept of atoms involves the idea of their general electrical constitution. From any atom there may be abstracted one or more small negative charges, all precisely alike, whose properties are in no wise dependent on the atom from which they come and all quite capable of existence by themselves without the presence of the remainder of the atom. These we call electrons, and they are able to respond to electric force and acquire velocity under such force action.

X-rays originate in any region where the velocity of electrons is suddenly changed. In the radio active break-down of atoms this change is a sudden acquisition of velocity and gamma rays are produced. In the X-ray tube we stop a high-speed stream of electrons by interposing a metal target and at the point of impact X-rays are generated. The X-rays are in their nature practically identical with



light except that they are shorter than even the shortest light waves. This shortness of wave lengths gives them certain characteristics, notably, the property of penetrating objects which are opaque to ordinary light. They cannot be detected by any of the senses, but can effect the emulsion of a photographic plate and induce a fluorescence or light effect in certain crystals. They have a stimulating or destructive action on living cells, a property utilized in radiotherapy, and they render certain gases conductive to electricity, a property useful in the study of the radiation. Since fluoroscopic examination is rarely applicable to our work, from the point of view of the dental radiologist it is the property of acting on the emulsion of a photographic plate or film that is of foremost importance.

An X-ray tube consists of a highly evacuated tube with thin glass walls. Into this are sealed two specially designed metal terminals, the anode or target and the cathode.

Without attempting to go into the electrical side of the various apparatus, we will assume that we have from our transformer or coil an electrical supply of the requisite high voltage. When this voltage is applied to the anode a stream of electrons moving at very high speed is released from the cathode. These electrons travel in straight lines and the cathode is so shaped that they converge on a focal spot on the centre of the target or anode. The target metal most used is tungsten, which combines high atomic weight with a melting point of over 3,000 deg. Centigrade. This high melting point is essential since enormous heat is generated at the point of impact, and even a tungsten target may readily be melted by injudicious handling of the tube.

At the point of impact X-rays are generated and radiate in straight lines in all directions. The penetrating power of the rays is dependent on the speed of the electron or cathode stream, and this in turn is directly dependent on the voltage applied. The quantity of rays produced is dependent on the quantity of cathode rays, and this depends on the amount of current passing through the tube. For X-ray production a very high voltage running to many thousands of volts is essential. The current used is small. Measured in thousandths of an ampere or milliamperes.

In the Coolidge tube, which is superseding the older gas tube, the quantity of X-rays produced is under direct control by a special device which controls the electron supply by increasing or decreasing the temperature of the cathode.

We do most of our work at a 5-inch equivalent, that is, something over 60,000 volts, and at 26 milliamperes. This gives a satisfactory intra-oral film in  $1\frac{1}{2}$  seconds, or a lateral plate in three seconds. A postero-anterior skull requires a slightly longer exposure.

Assuming a specific type of radiation if a variety of objects of like

thickness are taken in turn, their opacity—relative—will vary in proportion to their density.

#### INTERPRETATION.

It is generally recognized that to obtain good radiographs one needs some special training, but many seem to think that, given the radiograph, its interpretation requires no special knowledge or experience. No greater mistake could be made. Let me stress the fact that the intelligent interpretation of radiographs is an exceedingly difficult thing.

In the first place one must have a thorough knowledge of the anatomy and histology of the parts radiographed and their appearance and normal variations, as shown in the radiograph. Then one must understand the pathology of the parts and the variations produced in the radiograph by disease conditions. These things must not be known in a vague, general way; the work is so exacting and important as to demand a very close and particular study of the subjects I have enumerated to obtain the best results.

A diagnosis should never be given on a radiograph alone. A case should always be studied clinically. It is invaluable, but still the place of the radiograph is as an aid to diagnosis. A "spot" diagnosis after a perfunctory glance at a radiograph is as unscientific and fundamentally wrong as any other spot diagnosis.

Here I might digress to mention the resident medical officer, who, interrupted while playing cards by a report that a newly-admitted patient complained that his bed was full of ants, murmured, "Ah, diabetes mellitus!" and then called "three no trumps." But that is by the way.

With regard to dark or radio-lucent areas. From time to time it has been suggested that these may be merely the result of a past infection—that is, that they are practically scars. In the United States this matter of X-ray interpretation has been a subject of controversy for several years, and many workers have carried out research work with the idea of proving the infectivity or non-infectivity of these radiolucent areas. Bacteriological and histo-pathological research, by a large number of skilled men working with all the facilities offered by the many large teaching and research institutions, and also work along the same lines done by many individual workers—all goes to prove that in a very large percentage of cases these areas are certainly infective. In this connection I would quote Ivy—"Interpretation of Dental and Maxillary Roentgenograms," 1918:

"Even in the absence of symptoms, a periapical rarefied area, as shown in the odontogram, does mean usually that disease of some kind is present unless the picture has been made shortly after operation before the area has had time to become obliterated. The state-

ment has been frequently made by some eminent authorities that these areas of rarefaction, as shown by the Roentgen-ray, are non-infective in the absence of pain and local symptoms, and may simply represent the results of previously existing disease, in other words, that they contain harmless scar tissue. While conceding this possibility in a small number of cases, I believe that the persistence of such a rarefied area for any length of time without signs of decreasing in size is sufficient evidence that a disease process is going on, otherwise the area would gradually become smaller and be replaced by new bone. There is abundant post-operative X-ray evidence that these areas of rarefaction disappear and are replaced by new bone, unless infection remains.

"Operative and post-operative findings so strongly support the view that these rarefied areas, as shown by the Roentgen-ray, are active foci of disease in most cases, that, in our opinion, it is the wisest course to regard them as diseased until proved healthy, especially in invalids, as it is a much more serious matter to leave a potential source of systemic infection than to eradicate a possibly healthy area."

Another theory advanced is that where root canal work has been done these areas may be due to drug action. The fact of an area persisting and progressing over a period of years would surely rule out this possibility, and again we must look to the operative or post-operative findings.

Now and again after the extraction of teeth on X-ray evidence one hears it said, "I looked at the teeth and they were perfectly healthy." The utter absurdity of such a comment after a casual glance at the root ends is obvious. An apparently normal root apex, as examined microscopically, may, on bacteriological examination, yield cultures of virulent organisms.

In this connection I may remark that it has been my personal experience that the great majority of teeth which show radio-lucent areas in the radiograph do show pathological changes in the root apex even to an ordinary naked eye examination; sometimes these are exostoses, but more often they are of a rarefying nature, varying from a roughening and cupping cut at the apex to cases where the greater portion of the root has been absorbed. In many instances, more especially under faulty crown or bridge work, the roots are discolored, practically necrotic, and often literally stinking.

A diagnosis should never be given from a radiograph alone; a clinical examination is essential. The presence or absence of deposits, the occlusion, the general appearance of the investing soft tissues, and the condition of the adjoining teeth should all be noted. The nature and state of repair of any conservative work which may



have been done on the tooth should be observed, and also any tooth movement noted.

A history of the tooth—so far as is possible—should be obtained with regard to past treatment, pain or swellings. Vitality of pulp should be tested electrically or by thermal changes. The dried and mounted negative should be examined with a proper graduated light; an examination under an ordinary light is sufficient to show up gross lesions after development, but a dry negative and proper light must be used for a proper examination.

The presence or absence of dark areas is but one point in the examination. All tissues in diagnostic focus should be carefully studied. Special note should be taken of any fillings which may encroach on the pulp chamber—here it is essential to compare the picture with the tooth itself since a buccal, labial or lingual filling may appear in the negative to encroach on the pulp when such is not the case. Secondary dentin or pulp stones should be watched for the condition of the lamina dura, the peridental membrane and the inter-proximal bone tissue noted. Root fillings should be carefully scrutinized, and one should be alert for the presence of multiple apical foramina or unusual root canal conditions.

As one's experience broadens the more one can discover in the negative and the more temperate one becomes in one's judgment.

It is inexcusable to mistake—as sometimes occurs—the anterior palatine fossa, the antrum, or the mental foramen for a pathological area, though these render the detection of a true rarefied area in those regions a difficult matter in some instances.

In a radiograph of the region of the upper molar the coronoid process of the mandible may stimulate the remains of a root. With an upper molar two films may be necessary, one for the buccal and one for the lingual roots. When the buccal roots are foreshortened and out of focus a root filling, especially in the disto-buccal root, may simulate a perforation. In a two-rooted upper first bicuspid the super-imposed apices may give a deceptive roughened appearance to the apex.

Lacking perspective, it is sometimes difficult to ascertain the true relationship of roots to the mandibular canal or antrum. A series of exposures will help one to form a better opinion. A well-developed malar bone will sometimes render it impossible to obtain a clear picture of the upper molar and bicuspid region.

In examining a mouth thoroughly lateral plates should be taken. Many times these will show up an impaction, unerupted, supernumerary or tumour which might have been overlooked. For better detail intra-oral films may then be taken of doubtful regions. The plates are, of course, used in conjunction with the regular technique or film exposures.

Let me terminate these remarks by emphasizing once again that



the correct interpretation of radiographs is a difficult matter and well worthy of the closest study and attention to detail. I propose to show you a number of plates and films illustrating points brought out in these notes, which, I hope, will be of interest to you. I have selected these carefully and I think they embrace most of the different conditions to which I have alluded, and there are a number of other points in them which I can show you but to which no reference has been made owing to the necessary condensation.

With regard to periapical lesions, if I say that a certain radiograph illustrates a certain pathological condition that statement has in each instance been proved by the finding at operation. Where no such evidence is forthcoming I will merely give the opinion that such and such is probably the condition. In the majority of cases where a history has been obtained and clinical examination made, a tentative diagnosis can be made from the radiograph of what the operative finding will be, with some degree of confidence.

#### BIBLIOGRAPHY.

U.S. Army X-ray Manual.

Interpretation of Dental and Maxillary Roentgenograms.—Ivy.

Oral Roentgenology.—Thoma.

Oral Abscesses.—Thoma.

Dental and Oral Radiography.—McCoy.

Elementary and Dental Radiography.—Raper.

Oral Sepsis in Relationship to Systemic Disease.—Duke.

—*Australian Journal of Dentistry.*

### “ Forcepitis ”

**A** CROSS the Pond, at Uncle Sam's where folks are fond of gourds and yams, a comic cult has spread its lure, with strange result—the Dental Cure.

Has Silas P. a gouty toe, he craves to see a canine go; derangement of the plexus solar bids him to sacrifice a molar.

You never saw, the Press declares, so great a “draw” as dentists' chairs; the waiting rooms are all alive with baseball sloggers off their drive.

Embonpoint, molarless, may wear the bathing dress of yesteryear, while tourists mulct in higher fares will find relief in dental chairs.

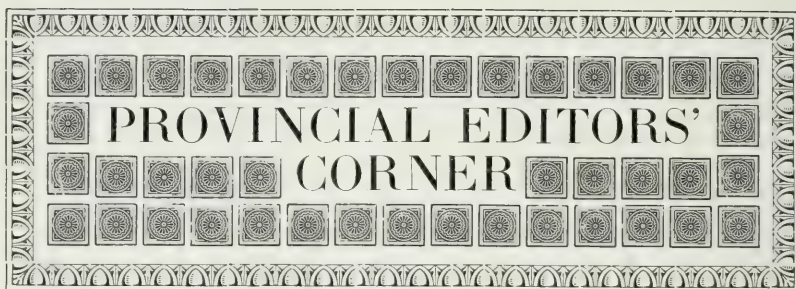
For lovelorn lass or jilted youth to find the cure, remove a tooth; for fortune lost there's nothing nicer than snatching out a sound incisor.

Perspiring youth across the net may yield a tooth to win a set, and yachtsmen gain a firmer grip upon the Cup, with sanguined lip.

'Tis said the craze may cross the sea and change the ways of you and me; that golfers soon may count it fun to miss a tooth and hole in one.

When every ill we have to bear shall vanish through the dentist's chair, how wise the world will grow beneath the slaughter of its wisdom teeth.

L.H., in the *Daily Chronicle*.



## BRITISH COLUMBIA.

### The Vancouver Meeting

A. T. OBERG, D.D.S., VANCOUVER.

THE joint post-graduate meeting of the Washington, Oregon, and British Columbia Dental Associations, held at Vancouver during the week of July 11 to 16, will go down in the history of Western Canada—and, in fact, of the North Pacific Coast—as the most successful and instructive meeting ever held in that section. Clinicians in attendance go somewhat further, and say that it was the largest, best equipped and best organized post-graduate meeting ever held in North America.

Nearly three hundred dentists, chiefly from Oregon, Washington and British Columbia, but including as well a good representation from Alberta, Saskatchewan, Manitoba, Idaho, Montana, California, and even far-away Alaska, were in attendance, practically all of them as post-graduate students in some one of the many classes taught.

The work of putting on this meeting was left entirely to the executive of the British Columbia Dental Association, who had been working on it for nearly a year prior to the date set. Acting under the able direction of the President, Dr. W. J. Bruce, the committee endeavored as far as possible to care for every detail, and, judging from the comments of visitors and clinicians, their efforts were entirely successful.

The commodious King Edward High School was secured for the occasion. Assembled in convenient rooms for the different courses were to be found ample facilities, such as laboratory benches with Bunsen burners, electric lathes, electric engines, operating chairs, electric furnaces and the various appurtenances needed for the smooth carrying on of work in teaching the subjects of the various post-graduate courses. There was a large cafeteria on the top floor.

where lunch was served each day to the men in attendance, thus avoiding loss of time and effort in going to the city for their mid-day meal.

All classes and everyone in attendance gathered in the large assembly hall at eight o'clock each morning for a lecture from some one of the eminent clinicians in attendance, and on two evenings of the week lectures were held until eleven o'clock. After the morning lecture the classes assembled in their respective rooms, and work continued there throughout the day. It was distinctively a meeting of hard work for everyone, some of the visitors stating that they had put in a much harder week of work than they would have had they been in their own offices.

The following is a summary of the classes taught and some of the more radical and new ideas advanced:

Dr. Theodore W. Maves, Minneapolis. Cast Gold Inlay Restorations, as Abutments, and Modern Bridge Construction. He teaches two methods of investing—burning out and casting. By one, the carbonizing method, the maximum time from investing to casting is two hours. In the other method (the one he prefers) just thirty minutes elapse from the time he invests the wax until the casting is made. Centrifugal force he uses. Beautiful smooth castings were made in his class work with uniform success—which he attributes to splendid systematizing of every step. One interesting thing picked up from Dr. Maves' room was his decided preference for Taggart's investment compound. The best proportions for mixing are 20 to 9. Every box should be dumped out and thoroughly mixed. The balance which comes in each package should be worked over by cutting new notches—adding solder to water side until 20 dwt. of investment balances 9 dwt. of water.

Dr. Rupert E. Hall, Chicago. Full Dentures and other important Prosthetic Restorations. In his lecture he laid stress on the fact that no longer does he try to make an absolutely tight non-displaceable plate. No more rebasing, or it will be necessary to keep on rebasing every little while. He uses black tray forming compound for the initial impression—muscles trims, and puts soft plaster in this for final impression.

Dr. I. Lester Furnas, Cleveland. Full Dentures, with practical cases for each member of the class. He was seriously ill the second and third day. Dr. C. J. Stansbery, of Seattle, carried on this class until Dr. Furnas was well enough to return. The men taking this course were very enthusiastic about it.

Dr. Arthur E. Smith, Chicago. New Course in Anæsthesia and Dental Surgery. This class did a prodigious amount of practical work, and was one of the largest and most interesting classes at the meeting. Ample clinical material was available to demonstrate the



many varieties of surgical operations in the mouth, and the application of block anæsthesit under varying circumstances.

Dr. Charles A. Furrow, Tulsa, Okla. Partial Dentures and Removable Appliances. In his course in removable bridgework and partial denture construction he dwells on the virtues of the wire basket clasp instead of using the cast clasp, owing to the tendency of the latter to induce rapid disintegrating of the tooth substance covered. The wire clasps are all bent—none cast—he says no metal has yet been found which can be cast and retain the strength and other desirable qualities of those bent and soldered clasps made of Ney's elastic wire. Cast clasps he uses in many places, but not so universally as formerly. All cast clasps are now made of Thos. Dee & Co.'s No. 4 gold. The color is better and they are stronger. No metal containing paladium can be recast, he says, without becoming brittle, owing to the contaminating influence which plaster has on this metal.

Dr. Hugh Avary, San Francisco. Porcelain Restorations. Practical porcelain work was done by each member of the class, some beautiful results being obtained. In fact, so interested were the members of his class that they were seldom seen outside of the classroom.

Dr. Ward and Dr. Pollia, San Francisco, gave a varied course in X-Ray diagnosis, dental surgery and pyorrhea operations. Dr. Pollia is a physician and a very forceful speaker. He made quite a favorable impression in his two lectures—one of which was attended by the local medical fraternity. Dr. Ward operated in the hospital several times before his class, and satisfied everyone as to his ability as a teacher and operator. Incidentally as a story teller he is a peach—especially well does he tell Italian stories.

Dr. Wallace Seccombe, of Toronto, gave two highly interesting and instructive lectures, one on "Dental Economics," and the other on "Preventive Dentistry," laying special stress on the influence upon and relation of diet to dental disease. His presence helped lend a truly Canadian spirit to the meeting, which was greatly heightened by the large Canadian representation in attendance.

Among the entertainment features was a large supper dance at the Hotel Vancouver on Wednesday evening, where the visitors were the guests of the Vancouver and Victoria Dental Societies. On Saturday afternoon the visiting gentlemen were the guests of the members of the British Columbia Dental Association at a stag picnic held at Seaside Park. A Canadian Pacific coastwise steamer had been chartered for the occasion, and numerous features of entertainment were provided, including an almost too realistic mock trial aboard the boat, athletic sports at the park, and an open-air dinner served in picnic fashion before returning to the city.

All and sundry were highly delighted with the entertainment



furnished, including the visiting ladies, who were treated to some form of novel entertainment every day, this work being in the hands of a large committee of local ladies, who lent admirable support in this respect.

The various committees having this meeting in hand were as follows:— Programme: Drs. W. J. Bruce and T. W. Snipes; Reception: Dr. J. E. Black; Quarters and Exhibits: Dr. J. Milton Jones; Finance: Dr. J. F. Hill; Clinical Material: Dr. O. N. Leslie; Hotels and Refreshments: Dr. P. H. Van Dervoort; Entertainment: Dr. W. J. Lea; Publicity: Dr. A. T. Oberg; Garages: Dr. W. F. Wright; Golf Competition: Dr. T. W. Snipes.

### In Appreciation

*Original Contribution by Mrs. W. P. Cameron, wife of Dr. Cameron, of Wenatchee, Wash., who was present at the Vancouver meeting and wrote above lines impromptu.*

**W**E never had a better time, the ride, the eats were simply fine,  
We never dreamed that so much fun could to the wives of Dentists come.

This trip with mountains all around, in praise of it we all are loud,  
And bless the Dental firm that planned, this outing for us simply grand;  
Thank Mr. Henderson and ask, that he who undertook this task,  
Who served refreshments really "swell" and did it all so very well.  
Tell Temple-Pattison that we, on board the boat all now agree  
The trip to-day has been the test and proved "they carry just the best."  
Three rousing cheers for them we'll give. Oh, may this generous firm  
long live.

A perfect day, a perfect treat; this Dental house cannot be beat.

### Alberta Dental Association Convention

JOHN W. CLAY, D.D.S., CALGARY.

**A** CONVENTION at Toronto the latter part of July would be—well, the editor of this journal would certainly delete the rest of this sentence; and besides, everybody knows, anyway. It makes me perspire to think of it.

A convention at Edmonton the latter part of July is a delightful experience, as all who attended this year will agree. Pleasant sunny days, cool nights, comfortable surroundings, an excellent programme, and kindly entertainment should make a convention a success. These conditions were all to be found at Edmonton.

The sessions were held in the University of Alberta buildings at South Edmonton. On the high banks of the Saskatchewan River, across from the Legislative Buildings, is a large area of land wisely laid aside by the now defunct Liberal Government for educational purposes. In a few short years there has been developed a University of which Albertans are justly proud. The buildings are laid

out with thought for the future, and they would be a credit to the largest educational institutions on the continent. A University with a splendid staff and two thousand students, with dormitories and dining room to accommodate five or six hundred students, all created in a few short years, is a splendid achievement.

The programme committee secured the services of Dr. A. E. Webster, Dean of the R.C.D.S.; Dr. T. W. Maves, of Minneapolis; Dr. I. Lester Furnas, of Cleveland, and Dr. Arthur E. Smith, of Chicago. Dr. Webster read splendid papers on diagnosis, amalgam technic, and root canal treatment. The address on root canal work deserves special mention. It was a sane, conservative, and extremely candid presentation, which seemed to throw some light on the subject, for those of us who have been lost in a sea of uncertainty.

The scientific study of cast gold work by Dr. Maves is a revelation. A detail of the technic of the carving of wax to restore proximal surfaces of bicuspid and molars is worth special mention. When the carving of the wax pattern for inlay, carmichael or crown is about completed, with the sulci and marginal ridge properly defined, a small but important change is made. A small fissure or break in the marginal ridge is made to the lingual of the contact point. The effect of this is apparent. A little food squirts through the fissure on mastication, hitting the proximal gum tissue just lingual of the crest, and a cleansing and massaging effect is produced which will keep the proximal tissue healthy. This is a simple step which can be used to advantage to improve proximal amalgam fillings.

Dr. Furnas on full denture work and Dr. Smith on some phases of Oral Surgery rounded out a remarkable programme with their well-known ability.

In addition to the above, there dropped into Edmonton during the convention, Dr. Wallace Seccombe, who was there on University business, and Dr. Rupert Hall, of Chicago, who came because he wanted to. Dr. Seccombe gave a very interesting talk on Dental Educational matters of interest to Alberta, especially showing the need of the pre-dental year, which the University of Alberta is adopting.

Dr. Hall very kindly gave a paper on Impression Taking, and later a clinic to demonstrate, and created admiration as well as a sensation by his frank acknowledgement of a complete change in his methods and objects in impression taking. One could not help but be impressed by the quiet statement that post-damming is an error, and muscle trimming with the heated border of the black impression compound is an error. The tight denture made from such an impression becomes less tight in a few months, much to the disappointment of the patient and the operator, for the reason that the pressure of the

periphery produces atrophy of the underlying bone, which is surely an injurious thing.

The members of the Edmonton Dental Society, who took the responsibility of the meeting, could not do enough for the visitors, providing everything that one could wish and even more. For instance, when Dr. McKeage of Nanton volunteered for a second division block anesthesia by one of the Edmonton clinicians, he was at once accommodated and for good measure had a fine large Haematoma (about as big as a twenty-five cent ink bottle, and later becoming about the same color) thrown in for good measure. Yes, they could not do enough for us.

All in all it was a splendid meeting, and the Alberta Dental Association is indebted to the Edmonton boys for staging a very successful convention.



Dr. Gilmer came to Western Canada to become acquainted with its beauties. Dr. Kennedy of Calgary introduces him to one. Dr. Gilmer and a Sarcee Medicine Man, Calgary, Alberta.

## Dr. Thomas F. Gilmer in Calgary

Dr. Thomas F. Gilmer, Dean Emeritus of the North Western University Dental School of Chicago, was in Calgary for the week of August fifteenth as the guest of the Calgary Dental Society.

Six sessions of lectures and clinics were held, and operations were witnessed, all the way from a plastic operation on the nose and lip, to the removal of a minute cyst from "Ernie" Doyle's left ear. It is pleasing to announce that the operation was successful and that "Ernie" bore up with great bravery.

The kindly courteous manner and able teaching were much

appreciated, and a very hearty welcome from the local society will always meet Dr. Gilmer on the occasion of any further visits on his part to Calgary.

---

## Dentistry in Saskatchewan

---

C. W. PARKER, D.D.S., REGINA.

---

**S**ASKATCHEWAN is one of the newest provinces of our Dominion, and along many lines of endeavor is not trailing the other provinces.

Those who have been interested in the organization of the dental profession here have invariably met with signal success. We now have on the statute books of the province one of the best dental laws of any of the provinces, modelled largely after the Ontario Act.

The Saskatchewan Government, under the premierships of the Hon. Walter Scott and the present incumbent, the Hon. Melville Martin, has always been most courteous to our Association's requests in the matter of amendments to the Dental Act, as the need has arisen, and has always taken a very decided interest in any matter which, in the opinion of the Association, would tend to place our profession on a more solid ethical basis.

Up to 1918 there had been no provincial annual convention held in this province, and any work that was done for the profession as a whole was done by Council, really an Executive Committee created under the Dental Act. In that year, however, the Provincial Association was formed and held its first convention in the City of Moose Jaw under the presidency of Dr. Frank C. Harwood.

At this meeting our own Dr. Cummer, of Toronto, put on his course in Partial Denture Construction, and when it is stated that none of our conventions since have been of more value to the members of our profession than his course, it is not detracting in the least from those highly beneficial courses that have been given in other years.

In 1919 the convention was held in Saskatoon, under the presidency of Dr. P. W. Winthrope, of that city, when Dr. C. N. Johnson, of Chicago, was the chief lecturer and clinician. It is almost needless to state that every one in attendance was inspired by Dr. Johnson's optimism and genuineness, as well as being helped by his practical talks.

In 1920 all roads led to Regina for the Annual Convention, with Dr. G. E. H. DeWitt presiding, and Dr. Elmer S. Best, of the University of Minnesota, as the main essayist.



This year our convention was held in Moose Jaw again, and Dr. F. E. Roach, of Chicago, was with us for the entire meeting, and Saskatchewan dentists went home from this meeting imbued with the desire to render more and better service to their patients after hearing Dr. Roach.

Our Association is now well established on firm ground and with the right officers to guide it in the future, and with the co-operation of the individual members of the Society, we are looking forward with high hopes and with a determination that dentistry in Saskatchewan shall take a place second to none.

---

## Manitoba

---

W. W. WRIGHT, D.D.S., WINNIPEG.

---

DRS. C. FITZPATRICK and D. A. McCarten, with their families, are holidaying in Ontario. They motored to Duluth, and then took their autos on board ship with them.

The newly-elected officers of the Winnipeg Dental Society for the 1921-22 session are as follows:—Pres., Dr. C. P. Banning; Vice-Pres., Dr. Roy Bier; Sec.-Treas., Dr. A. Clint; Committee, Dr. M. Bowles and Dr. D. A. McCarten.

Dr. T. O. Forsyth has discontinued the general practice of dentistry, and is now specializing in Exodontia at his new office in the Boyd Building.

Dr. Stoddard has assumed the duties of dentist at the General Hospital.

Winnipeg has a great bunch of golf enthusiasts among the Dental Profession, every Wednesday afternoon being used in tournaments. The Temple-Pattison Cup and the Ash Cup are being played for.

The convention in Vancouver was attended by Drs. T. O. Forsyth and Dr. A. T. Lang.

The proposal to erect a medico-dental office building on the co-operative ownership plan is held in abeyance at present.

Dr. John McDougall is visiting relatives in the East.

---

TO PREVENT ENGINE BELT FROM SLIPPING.—To compensate for alternate moist and dry days and avoid the necessary adjustment, and also have the engine belt run easily and grip, slip the smallest rubber band over the wheel that you can tease over without tearing and into the grooved pulley. I have tried this on a large wheel of a sewing machine as well, and it works like a charm. Try it.—C. R. Scholl, D.D.S., Reading, Pa. (*Dental Cosmos*).

# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## ELECTRIC TEST FOR PULP VITALITY.

**D**R. HOWARD R. RAPER, in The International Journal of Orthodontia, points out that in practice there are thousands of cases where the use of the electric test for pulp vitality is indicated, and where the accuracy of the diagnosis depends upon it. In many cases it is absolutely necessary to the correct interpretation of dental radiographs. As a diagnostic measure, it is second only to the radiograph.

Many teeth have such small fillings that we do not suspect any trouble with them; yet it has been the experience of all dentists that many teeth, with even a very small artificial enamel filling, will show a condition of devitalization if tested out with the electric current.

Many times we have a radiograph of two or more teeth where the abscessed condition seems to involve more than one tooth, and yet we cannot say definitely which teeth are concerned in this condition. At least any attempt along this line would be pure guesswork. But the electric test for pulp vitality will indicate precisely the vital pulps, also those involved in the abscess.

It would appear to be quite necessary for us to make an X-ray examination as well as the electric test for vitality if a correct and complete understanding of many cases is to be reached. One is used to supplement or check up the other. In many cases the pulp of a tooth will have receded to such an extent that a thick barrier of secondary dentin is in evidence. The pulp is vital, yet the electric current will not penetrate it. Here, then, is a case for the X-ray.

It is quite often a difficult thing to decide whether the spot seen in the radiograph of the end of the bicuspid teeth is an abscess or just the mental foramen. Here the electric test for vitality will prove valuable. Sometimes the radiograph may show an abscessed condition about the cuspids and bicuspid, which is larger than an antrum, and great difficulty may be experienced in determining which teeth are involved. The quickest and most accurate method to follow in such

a case is to supplement the X-ray findings with the electric test. In this way the vital teeth may readily be isolated. We sometimes have to treat comparatively rare cases of "pyorrhea" where, instead of the pus discharging about the neck of the tooth, it discharges like a dento alveolar abscess through the external alveolar plate. The treatment indicated for pyorrhea is vastly different from that indicated for a dento alveolar abscess, hence the necessity for correct diagnosis. A radiographic examination, supplemented by the electric test, will aid us in the correct treatment of such cases.

Frequently we meet with cases where there is a perforation of the external alveolar plate of bone on a level with the bifurcation of the roots, which is due to the thickness of the oblique ridges. The radiograph will show a radiolucent spot at the bifurcation of the roots, but no abnormal condition at the ends of the roots. Although the tooth is abscessed, there is no evidence of it at the apices of the roots. An electric test, however, will readily show the condition, and much time in treatment is thus gained through having a correct diagnosis.

#### A NOTE ON AMALGAMS.

**I**N an effort to clear up some of the difficulties usually met with when making amalgam restorations, Dr. P. Giles gives an account of his methods in *La Revue de Stomatologie*, No. 4, 1920, a report of which is published in *The Dental Record* of August, 1920.

Amalgams do not contract, nor do they expand; they tend to assume a globular form; for that reason a filling which was cubic when inserted, later on projects beyond the cavity, and is no longer in contact with its sides. These things occur only when amalgams are badly made, badly prepared, and badly condensed. They are always due to operative faults. In order that an amalgam shall not change its shape or color it must, at the moment of preparation, be vigorously triturated, and into its composition only the minimum of mercury compatible with amalgamation must enter.

The mercury holder must have a very minute opening so that the mercury is dusted out of the opening. The mercury is not allowed to fall directly upon the alloy, but is incorporated from the sides of the mortar.

The alloy and mercury are well triturated in the mortar, and from time to time the small particles of the alloy are brought from the sides of the mortar and placed in the bottom. This assures homogeneity.

When the mixing is complete the amalgam should appear to have been pulverized, and beginners think they have not put in enough mercury. Place the amalgam in a piece of chamois leather and squeeze into a button and flatten it so that it can be compressed by heavy pliers. The amalgam will not be perfect if the greatest pres-



sure of the pliers extracts more than two or three minute drops of mercury.

The block of amalgam so obtained is very compact and hard, and cannot be easily marked with the nail. It appears as though it had already set. The characteristic appearance of the amalgam when removed from the chamois leather and the absence of mercury when pressed indicate that the desirable proportion of mercury and alloy has been obtained.

The tooth cavity into which this amalgam is to be inserted must be well prepared and, if possible, a matrix adjusted. Cut the lump of amalgam into a small number of large pieces. These are packed into the cavity with a serrated plugger, using as much pressure as possible. When the cavity is filled, the amalgam is further condensed with the automatic plugger, and, in order not to mallet the amalgam direct, it is separated by a pledget of cotton-wool. This procedure brings the mercury to the surface, and this part of the filling should not be soft; but this superficial portion is less dense than the mass. It can be made more compact by incorporating with it some filings of the alloy, these being burnished on the surface. Such fillings will neither change color or shape.

#### A NEW ATTACHMENT FOR PARTIAL PLATES.

IN "The Dental Summary," a new form of clasp for partial dentures is described by Dr. L. E. Custer, of Dayton, Ohio. He finds that the present standard forms of attachments, namely: Griswold, Roach, Gilmore and Bischoff, although more or less successful, are open to serious objections. They require in most cases the crowning of the teeth which are used as abutments. They all require in their construction the most precise technique to be found in prosthetic dentistry, any detail of which proving faulty usually causes ultimate failure of the entire scheme. They are not strictly hygienic. They do not allow wide individual movement of the abutment teeth. None of them have a wide latitude of spring, so that future adjustments often are necessary and the life of the appliance is thereby seriously shortened.

In making any appliance where the natural teeth are used for support, it must of necessity have spring to it. Now the chief problem is to make a clasp with a wide latitude of spring, without having it undergo any change in its molecular structure. The dentist has been confined entirely to the use of various alloys of the noble metals when making appliances for use in the mouth. These alloys unfortunately do not have as wide a range of spring as does steel and the like. They may be bent just so far, and no farther, if we wish them to return to their original positions; beyond this point the molecules change relations permanently and the spring does not return to its original position.



A state of crystallization takes place, and if the spring is bent repeatedly it will break. Dr. Custer's scheme is to provide a metal clasp made of a noble metal which is not bulky, and yet has a wide range of natural spring, so wide as to admit of all necessary spring without crystallization, and at the same time take up little space and be hygienic.

The technique is this: Take an inch and a half of sixteen or eighteen-gauge round gold clasp wire; bend one end into a sharp crook, or solder a metal lug on the end to secure this end firmly in the vulcanite of the plate; now wrap around this, just beyond the lug or loop, two or more turns of vellum rubber, about half an inch wide, and vulcanize. (This can be done when other cases are going through.) Two complete turns of Dougherty vellum makes an average thickness. A stock of these may be made up with different thicknesses and lengths of rubber for the different cases that present, bearing in mind that the thicker and longer the rubber covering the wider may be the movements of the spring.

The object in vulcanizing the vellum rubber first is that it will not flow or change its shape when vulcanizing with other rubber around it. It is sometimes possible to secure a vulcanized vellum rubber tube from which sections may be cut and these slipped over the springs before waxing up. Vellum rubber may be vulcanized repeatedly without becoming hard.

The model of the case is then struck up as usual. When the case has been waxed up, cut a deep groove in the lingual surface of the last tooth in the row to receive the spring clasp. Place the clasp with the vellum rubber tight against the posterior-proximal surface of the last tooth, bending the free end to fit approximately a short distance around the tooth; the rest of the end is to be covered with plaster when flasking, so as to hold the clasp securely in place. The vellum rubber is now smoothed over with wax, being careful that it is embedded deeply enough to insure finishing the plate without it being exposed.

The plate is now finished in the usual way, and upon examination it will be found that the spring clasp does not touch the hard rubber anywhere except at its enlarged inner end, where it is intended to be firmly held.

The wire protrudes from the plate, and may be sprung in any direction from one thirty-second of an inch to greater distances, according to the thickness of the vellum rubber. This is due to the fact that the spring extends far back in the plate, where it is grasped by the hard vulcanite. The vellum rubber, while slightly aiding the spring, is principally for hygienic purposes, to fill in the space between the clasp and hard vulcanite, yet yielding under pressure.

The case is now finally adjusted in the mouth. The surplus end

of the spring is clipped off, leaving the clasp to reach completely around the lingual surface of the tooth to the one forward of it. It should be bent up or down (being round wire it admits of this) until it impinges just below the largest bulge of the enamel. The extreme end should now be made to bear hardest against the tooth, for in so doing the buccal support need not come so far forward. The extreme end of the support need only be diametrically opposite the point of the flexible spring on the opposite side.

In the completed plate we have a fixture in which the supporting tooth or teeth are firmly sustained in place by the support on the outside, and yet the plate is securely held in place by the long flexible clasps on the inside.

#### ORAL HYGIENE IN FAIRY STORY.

**A**NYTHING that will aid in holding the children's interest in the care of their teeth will be gladly welcomed by all dentists and parents. Of especial interest for school dentists is a brief phantasy entitled, "The Ivory Castle Fairy Book," published by a firm of English dentifrice manufacturers, Messrs. D. & W. Gibbs, London.

This book contains the thrilling story of the construction and guarding of each Ivory Castle (tooth) which is being attacked by a cunning and skilful enemy, the "Caries Imps." The various methods of attack and defence are cleverly worked out in the language of fairy truth. Such a book might well become part of every child's library, because it is possibly as rich in imaginative quality as most fairy stories, and at the same time many true conditions relating to the care of the teeth are portrayed.

#### PREVENTION OF DISCOLORATION OF TEETH DUE TO AMALGAM STAIN OR SHADOW.

**A** TOOTH, though filled satisfactorily, may prove unsightly because of the formation of stain, or because of the shadow thrown by the dense metal imbedded in the tooth structure. To overcome this objection, Dr. Percy B. Cohen, West Maitland, N.S.W., suggests the following:

Smear the cavity to be filled with a tooth lining consisting of Canada balsam dissolved in ether—or any other tooth lining. Then take No. 4 gold foil, either cohesive or non-cohesive, cut in small pieces, and so place in the cavity as to cover all the walls and margins, and force to place with a pledget of cotton-wool; then fill with amalgam. This process has three advantages, viz.: prevention of the discoloration of the tooth, prevention of shrinkage of the margins, and it also gives the tooth a beautiful lustre.



## It Is All Wrong

I WAS in Europe when the war broke out, and I have never succeeded in getting the taste from my mouth yet. I was made acquainted at that time with a condition that I did not know existed, and I have not been quite so happy since. I saw countries lying side by side with nothing to mark the line of demarcation except the barriers made by man. The soil seemed the same, the verdure was the same color, the trees the same shape and size, the breezes blew precisely the same—everything in nature the same, and yet man has done this monstrous thing—he has fought for centuries with his fellow-men, so that he may say a certain side of this imaginary line belongs to him and does not belong to his fellow-man. Nature in her beneficence has spread out the world with its land and water for the welfare of the creatures who inhabit it, chief of which is man. But man from the earliest history has spent much of his time and most of his energy quarrelling over the occupancy of the land. There is enough land in the world for the comfortable sustenance of all men, and if the energy of man were occupied in improving the conditions of existence, the present land area could be so vastly benefited that this earth would be a paradise to look upon and live upon. But instead of that, destruction and death are spread throughout the earth by men fighting each other and killing each other over disputes as to the ownership of certain areas of territory.

In Europe I was introduced to a state of affairs that I did not dream could obtain in this world. I saw the people of one country maliciously suspicious of the people of another country. I saw two countries snuggled down together, as I have said, with the same sun shining over them, and nothing in nature to mark a distinction between them; and yet I saw an imaginary line set up by man running between these countries, and a barbarous formality necessary in order that even respectable people might pass from one country to another. Up to that time I had never seen a passport in my life, and I pray to heaven that I may never see another.



I was brought up on the North American Continent, where, thank goodness, two nations have lived side by side for a hundred years in peace, and I was not bred or educated to be suspicious of my neighbor. I have passed freely between these two countries back and forth, and up to the time of the recent great war I was never questioned at the border as to my citizenship, or my intents and purposes. When the war came these two countries, in the very nature of things, had to enquire into the character of the people who travelled back and forth; but even in the acutest stage of the war it was seldom necessary to have a passport to go from one country to the other. How different this is from the state of affairs in Continental Europe. There every little principality arrogates to itself the right to erect a barrier against the citizens of other countries, and to let them in only under conditions arbitrarily laid down and rigidly carried out. Suspicion is the dominant note that one encounters over there. And it is all wrong.

If that is the farthest that we have advanced in our civilization, then we have made of it a dismal failure. Suspicion, distrust and selfishness are the triumvirate which lead to war; and the more we contemplate the recent war the more we are impressed with the fact that it was a horrible and ghastly blunder. It set civilization back, and did not purify anything. We are dealing with the dregs yet, and the sediment is an unseemly mass of pollution. Even the glory of heroic deeds has palled on us, and to-day we hear no encomiums for the brave. What a spectacle, what a procession of human achievement! The war has caused us to lose our moral perspective, and has blurred our moral vision.

If Europe is to go on fostering contention, bitterness and hate; and, what is worse, if some of this is projected over to this continent by the machinations of selfish men, then indeed we must pause and raise the question as to the real status of our civilization. A week before the war broke out I was being entertained, with my family, about thirty miles outside of Paris. Our host was depressed over the prospect of war. I said to him that I felt there was really little danger of war, that war was too dreadful now, and that the powers that be would never permit it to come to that. "Ah," said he, "my dear doctor, I fear that you do not understand Europe." And surely I did not.

The great sin of humanity to-day, as it always has been, is selfishness—selfishness of men and selfishness of nations. And it is all wrong.

When the United States took Cuba from Spain and then turned the country over to the Cubans, Europe could not understand. When they took the Philippines from Spain and then turned around and paid her for them it seemed to Europe a grotesque piece of national policy. And yet it is only along such lines as this that the world is



to be regenerated. We will never have a real civilization till unselfishness and love shall have stamped out the baser instincts of suspicion, jealousy, racial hatred, national prejudice and all their miserable train.

Patriotism for one's country is a fine sentiment, but better than all else is an abounding love and sympathy for the whole human race. And until that comes we shall not clearly emerge from those rever-sions to barbarism which have been marked from time to time by the madness and frenzy called war. Each can do his share, however small and humble it may be; and this, it seems to me, is the outstanding mission, the Macedonian cry, of every human being in this the twentieth century.

*C. H. Johnson,*

### What Next?

*(Original contribution to Oral Health by Dora L. Cameron, wife of W. P. Cameron, D.D.S., Wenatchee, Wash.)*

THE teeth and tonsils met together  
To see were they to blame, or whether  
The doctors had it in for them  
Regarding all the ills of men.

The teeth felt sore, could not wonder,  
Declared the doctors all had blundered,  
The root of evil those good teeth  
'Twas foolish and beyond belief.

But since the X-ray came to light,  
Good looking teeth had died of fright.  
They'd lost their nerve, the X-ray proved,  
And doctors ordered them removed.

But if the poor soul suffered on  
Alas, when all his teeth were gone;  
The tonsils coming next in line  
Were taken out. Yes, every time.

The tonsils argued very long,  
Declared they never had gone wrong,  
Appendix troubles at an end  
The doctors just had picked on them.

"What next," the teeth extracted cried,  
"To lay the blame on we'll be spied,"  
The tonsils gurgled, "when we're gone  
They'll look for trouble further down."

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, OCTOBER, 1921

No. 10

## EDITORIAL

### Dental Welfare Foundation

THE National Dental Association at its Milwaukee meeting approved a plan submitted in the form of a paper by Dr. Rea Proctor McGee, and read before the Oral Hygiene Section and the House of Delegates, "whereby direct dental education of the public may be accomplished in an ethical manner, and at the same time have the burden of cost so widely distributed that it will not be felt by any individual."

The plan involves sympathetic co-operation between the National Dental Association and a Committee appointed by the American Dental Trade Association, and composed of W. Linford Smith (Chairman), A. S. Carman, J. C. Forstbauer, W. C. Smith, and Geo. F. Jones. Dr. Otto U. King, representing the Association, has been appointed to serve on the Board of Trustees of the organization, which is to function under the name of the Dental Welfare foundation.

The following letter states succinctly the details of the proposed scheme, and is published in full, that the profession may be familiar with every phase of the plan.

Milwaukee, Wis., August 19, 1921

National Dental Association, Chicago, Ill.

Attention Dr. Otto U. King, Secretary.

My Dear Dr. King:

Confirming my statement to the Board of Trustees of the National

Dental Association in connection with proposed operations of the Dental Welfare Foundation, this is to state:

First.—At a meeting of the American Dental Trade Association, held at Hot Springs in June, 1921, I was appointed chairman of an Educational Committee of five, and, at a subsequent meeting of the Executive Board of the Association, the Educational Committee was given power to act.

Second.—The National Dental Association is wholly and completely relieved of financial responsibility in the undertaking. Should a deficit result, it will be paid by the American Dental Trade Association.

Third.—The Educational campaign of the Dental Welfare Foundation will be operated entirely without profit to any individual or firm connected with those whom I represent, or anyone else.

Fourth.—Should a profit result, it will only be used for educational projects in this or other directions such as will meet with the complete approval of the authorities of the National Dental Association, represented by the Council on Mouth Hygiene and Public Instruction of the National Dental Association.

Fifth.—My object in seeking co-operation of the National Dental Association, is to submit to the Council on Mouth Hygiene and Public Instruction, for approval, text of the series of twelve educational messages which have been written by Dr. Rea Proctor McGee.

Sixth.—If these messages do not meet with approval of the Council, they will be modified in any way which may be suggested, or other messages will be substituted at the desire of the Council.

Seventh.—When the character of messages to be distributed will have been determined by the Council, I desire permission to print that fact on the face of each card it is proposed to issue.

Eighth.—Should unprofessional use be made of the service by subscribers, such subscriptions will be cancelled, the names received from the subscriber removed from the files and unexpired portion of subscription returned. The final authority upon what constitutes unprofessionalism will rest with the National Dental Association through its Secretary.

Ninth.—The Dental Welfare Foundation will submit to the Secretary of the National Dental Association for approval, every piece of printed matter that is to be issued in connection with the campaign, and will issue no printed matter without such approval. Very Truly Yours,

W. LINFORD SMITH, Chairman.

"It is proposed to print on postal cards a series of twelve messages of approximately 150 words each, and to arrange for their widest possible distribution through the co-operation of the individual dentist in his local community. The cards will bear no form of advertising matter of any sort or description."

The plan of distribution as described by Dr. McGee is as follows:

"The organization and facilities for distribution possessed by the American Dental Trade Association will be put in operation for securing from the individual dentist lists of persons who, in his opinion, will be benefited by reading strictly ethical information as to what dentistry stands for.

"The suggestion will be offered that these lists should be compiled from local organizations—civic, fraternal, religious, political, educational, etc.; or in smaller communities, the cards could be mailed to the home address of each individual taxpayer.

"When the lists will have been received, the names they contain

will be transferred to stencils, and machinery will be installed at a Central Bureau, where a sufficient clerical force will be maintained to keep the lists alive and to handle the addressing and mailing of the cards.

"To assist in covering the cost of the campaign, the service will be offered to individual dentists at \$18.00 per annum, for the entire series of twelve (which is \$1.50 per month), for each 100 cards. \$12.00 of this amount will be required for postage alone, and it is hoped that the balance will defray the cost of printing, addressing, mailing the cards, etc. Whatever deficit results, those whom I represent will pay the bill. No person, firm or group of men either hope or expect to derive any profit from the proposition. No salaries will be paid to those in authority, and no expense will be involved, aside from the actual cost of maintaining the service and details incident to putting the plan in operation."

The National Dental Association approved the plan as presented, and granted permission to the Dental Welfare Foundation to print on the face of each card distributed, the fact that the subject matter has been approved by the N.D.A. after such approval has been secured.

Many ORAL HEALTH advertisers have generously placed their space this month at the disposal of the Foundation, for the purpose of assisting in a country-wide campaign to secure the active support of the members of the Dental Profession.

---

## A Bust of Morton for the Hall of Fame

---

**I**N the election of Dr. Wm. T. G. Morton to the Hall of Fame the allied professions of medicine and dentistry have been singularly honored. By their overwhelming vote the electors have also evidenced the appreciation of the public at large for the beneficence of anesthesia.

Recently, at the annual dinner of the American Anesthetists in Boston, during A. M. A. Week, Dr. S. Adolphus Knopf, a leading advocate for the honoring of Morton, said it would be a proud privilege for the Associated Anesthetists to place a bronze bust of Morton in the niche assigned him by the electors. This is to be done on October 16, in celebration of the Diamond Jubilee Anniversary of Morton's First Public Demonstration of Ether Anesthesia.

The Associated Anesthetists, as well as other prominent leaders of the allied professions, are, therefore, urging all those interested to make a substantial contribution for this purpose.

F. H. MCMECHAN, M.D., *Secretary-Treasurer.*  
Lake Shore Road, Avon Lake, Ohio.



298

IT is an interesting fact that just as the invention of labor-saving machinery meant the employment of more men in production instead of less, so the invention of time-saving devices always leaves those who use them with less leisure than before. Man has never been so busy as he is now, when he talks through a telephone, dictates to a stenographer, and travels in an automobile.

—*W. M. Phelps.*



DR. ASHLEY W. LINDSAY,  
*First Dean of Dental Faculty, West China Union  
Univercity, Cheng Tu, Sze Chuan.*

*The West China Union Dental Faculty adopted  
the Pre-dental year for all dental students entering  
Session 1920-21.*

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, NOVEMBER, 1921

No. 11

## The Rest and Occlusal Bites, Hall System of Anatomical Articulation

W. E. CUMMER, D.D.S.

*Royal College of Dental Surgeons, Toronto.*

ILLUSTRATIONS, H. H. CUMMER.

ONE of the phases of Dr. Hall's system, which is of greatest practical value, and which is applicable to any system of anatomical articulation, is the conception of the proper distance which the edentulous ridges should be apart when the artificial teeth are closed, in full upper and lower restorations, for the purpose of greatest efficiency, comfort and retention, especially of the lower artificial denture. Because of this fact, and also of an occasional difficulty on the part of students of Dr. Hall's system of articulation in securing a clear understanding of this, the writer undertakes a brief note of explanation.

### ABSORPTION FOLLOWING EXTRACTION.

As noted overleaf in Fig. 1, the absorption or loss of bulk following the extraction of natural teeth is at the end of such absorption (9 months to a year) about one-third the length of the original crown and also the separation of the jaws at this position (the original closed position with the teeth locked in central occlusion) is approximately seven-eighths of an inch apart.

### OCCUSAL BITE, "REST BITE," AND THE PROFILE.

The occlusal bite, or the locked position of the jaws, with teeth in closest possible inter-relationship (central occlusion or occlusal

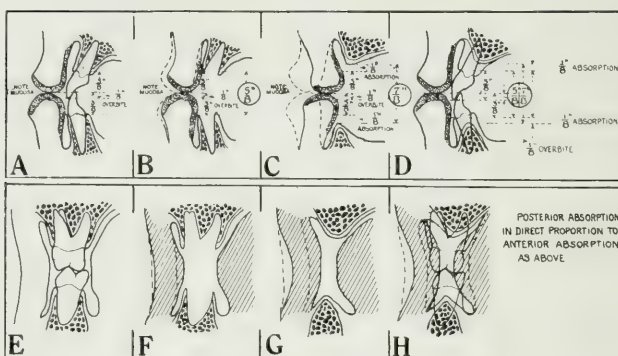


Fig. 1.—Absorption, and Proportions.

Presupposing, in terms of inches, the crown of the upper and lower teeth to be approximately three-eighths of an inch. (Black's average measurements indicate a trifle above for the upper central incisor, and a trifle below for the lower central incisor for the average individual), this chart indicates the approximate loss of tissue through absorption, basing this absorption on the supposition of the loss of tissue as one-third of the length of the original crown.

- (a) Upper and lower teeth in position. Note  $\frac{3}{8}$ " length of the crown with  $\frac{1}{8}$ " overbite.
- (b) Immediately after extraction. Lips lose some support.
- (c) Nine months to one year after extraction. Absorption, which is supposed to be one third the length of the original crown has here taken place,—this is noted as one-eighth of an inch. Upper chiefly at the expense of the buccal and labial plate, lower at the expense of buccal, labial and lingual plates equally, hence the formula.  $\frac{3}{8}$ " (upper crown) +  $\frac{1}{8}$ " (upper absorption) +  $\frac{3}{8}$ " (lower crown) +  $\frac{1}{8}$ " (lower absorption) —  $\frac{1}{8}$ " (overbite) =  $\frac{7}{8}$ " relation of absorbed ridges during **occlusal bite**. Note position of lips from lack of support of teeth.
- (d) Indicating the original teeth (in phantom) absorption, with approximate proportion.

—e. f. g. h., Proportions in Molar Region. Note similarity.)

bite), is a position assumed only during masticatory or similar movements and *not* while the jaws are in a relaxed position. When the jaws are relaxed a separation may be noted of approximately an eighth of an inch between the teeth, which is called "Rest Bite." In both positions the condyles are in their furthestmost distal position in the glenoid fossa, and also in the position of the "Rest bite" the profile reaches its most correct proportion. This may be readily noted by asking patient to "close" the natural teeth and a slight shortening of the lower third of the face is noted. As noted in Figure 2, the corresponding position of the edentulous jaw with absorption complete in rest position would approximate 1", or 1-8" more than occlusal position.

#### DR. HALL'S PRINCIPLE IN REGISTERING THESE BITES.

As noted in Figure No. 2, the additional step, as included in Dr. Hall's technic of registering the bite, is the removal of one-eighth of an inch of material from the lower trial plate, thus reducing its vertical height, and, by means of soft wax, bringing these trial plates again into accurate occlusal apposition with this lessened vertical



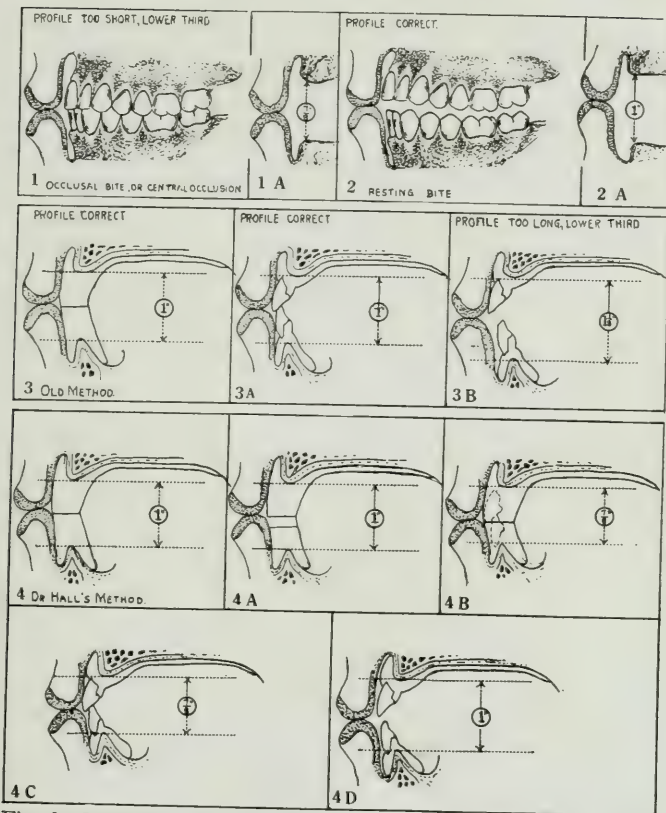


Fig. 2—Occlusal and Rest Bites, use made of these by Dr. Hall.

1. Indicates teeth in **central occlusion** or **occlusal bite**.
  - 1A. Corresponding distance between edentulous jaws. Profile too short, lower third slightly too close to nose.
  2. **Rest, bite**, natural position of teeth and jaws during relaxation, with teeth separated  $\frac{1}{8}$ ".
  - 2A. Corresponding distance between edentulous ridges one inch. Profile here correct.
  3. Old method of gauging length of upper and lower trial plates;—upper trimmed two millimetres past lips in repose and to occlusal plane. Lower applied to upper, soft and warm, and patient instructed to "close" till profile correct. Distance about 1".
  - 3A. The finished Denture made from trial plates in previous cut (No. 3) with jaws in occlusal bite at one inch separated, and in rest bite at **one and one-eighth inch separation**. In other words the lower plate  $\frac{1}{8}$ " too high, lessening its stability, causing strain, discomfort in taking, and also in masticating, food.
  4. Dr. Hall's improved method in which the trial plate, first upper to two millimetres past lips in repose, and second lower to conform to this is done as before giving one inch separation as in old method. Figures 3, 3A, and 3B.
  - 4A. At this stage Dr. Hall recommends cutting off  $\frac{1}{8}$ " from the lower trial plate as shown in this figure and
  - 4B. After having cut incision in the base of the upper trial plate, and placed two small balls of **soft wax** in the molar region of the lower trial plate as described in Fig. 3, the trial plates are then brought together in the **proper** relation for occlusal bite ( $\frac{7}{8}$ " ) and the setting of the teeth completed and the pieces finished.
  - 4C. Finished Dentures showing correct ( $\frac{7}{8}$ " ) separation in occlusal bite and
  - 4D. Finished Dentures showing correct (1") separation in rest bite, note diminished type of lower, increasing stability and comfort.
- CAUTION.**—Never shorten the lower to such an extent that the condyle tips back and interferes with auditory meatus and causes deafness. Check this by inserting tips of fourth fingers in patients' Auditory meatus. Many cases of deafness have been caused primarily by too short a distance between the maxillary, also have been improved and frequently cured by opening the bite and increasing these distances. See articles in literature by Monson, Wright, and others.

height of the lower. The correct profile, as seen by watching the patient on one side, forms basis upon which this primarily is done.

### STEPS IN TAKING BITE, HALL SYSTEM.

Here follows a brief summary of the original method followed by Dr. Hall, modified slightly. The summary of steps is as follows: Presupposing both stone models poured, the hard areas compensated by layers of tinfoil, base plate, both upper and lower, made of Impression tray compound (S.S.W.), about two millimeters or less thick, and accurately moulded to all contours out to the extreme periphery, and the upper bite rim securely moulded to the upper base plate.

1. Trim upper trial plate, two millimeters past lip in repose and midway between ridges (occlusal plane), keeping bite rims over or slightly lingual to the alveolar ridge. Cut cruciform incision over molar region.

2. Instruct patient to relax mandible using example of relaxed fore arm.

3. Build up lower bite rim and ask patient to practise closing with jaw relaxed holding mandible if necessary; when relaxed, insert lower with softened bite rim and ask patient to close quickly to place.

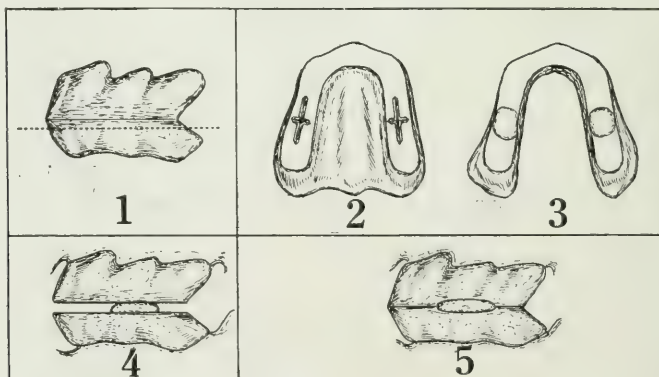


Fig.3.—Detail of Soft Wax Ball Contact in Securing Occlusal Bite.

The writer recently had the pleasure of witnessing a demonstration by Dr. Blanchard, of Springfield, Illinois, of the method of the final apposition of trial plates, which is at the present time in almost universal use among full plate men.

- A. Trial plate as in Fig. 2, No. 4.
- B. Plan of lingual side of trial plate. Note cruciform angular groove in molar region.
- C. Plan of lower trial plate, after one-eighth of an inch has been removed, (Fig. 2, No. 4A) with soft wax mounds securely fastened to occlusal surface of lower bite rim.
- D. Bite rim coming into position, with lower jaw relaxed, perhaps guided by the dentist. Trial plates come into first contact approximately in the centre of the trial plate or about the regions of the first molar, securing a muscular balance, otherwise not readily secured.
- E. Excess wax pressed to one side and a thin film remains, thus correcting apposition. Wax projecting in cruciform incision locks trial plate.

When profile is correct, ask patient to cease pressure. This gives rest bite with one inch separation (figure 2, section 4). Trim off lingual and labial excess of lower to width of bite rim on upper. Marking of upper in softened lower makes this process simple.

4. Remove one-eighth of an inch (figure 2, section 4a) from lower.

5. Fasten securely balls or mounds of Buffalo soft wax on lower region approximately five millimetres in diameter while soft.

6. Instruct patient to close, as in step 3; wax flattens out to an equalizing film, locking in cruciform incision and bringing back separation of jaws to the desired distance, namely, approximately seven-eighths of an inch.

---

## The Need and Value of Practical Demonstration and Actual Work to Acquire Skill and Success in Our Amalgam Work

---

DR. W. E. HARPER, CHICAGO.

---

**N**OTWITHSTANDING the excellent qualities of the alloy that you may use, a non-leaking, strong and stable amalgam filling is dependent upon the adoption and intelligent application of a *Correct Amalgam Technic*.

Experienced and conscientious operators occasionally succeed in making an amalgam filling that will resist a leak at five to ten pounds air pressure; but within a period of one to nine months a leak generally develops at a very low air pressure.

The reasons for these failures are now known and the remedy has been at your disposal for the past eight years, during which time it has stood the test of continued experimental work, clinical observation, and public demonstration, as hereinafter described; a test that has placed the Standardized Amalgam Technic beyond successful dispute by competent amalgam authority.

In accepting invitations to present this subject before many of our Dental Societies in the various States, it has been my policy to insist that interested amalgam operators in attendance make two series of test fillings.

These first series of test fillings were made preliminary to my talk and demonstration, using the amalgam procedure as carried out in every day practice.

The second series of tests were made by the same operators, applying the Standardized Amalgam Technic (so far as it had been understood), following a two hour talk and demonstration by myself.

The best evidence of the value of this more practical form of in-

---

\*Read before meeting of Toronto Dental Society, October, 1921.



struction is made significant by a comparison of the tests made "before and after taking."

I present the following report of tests made at a representative meeting. These reports may be accepted as typical of all I have attended.

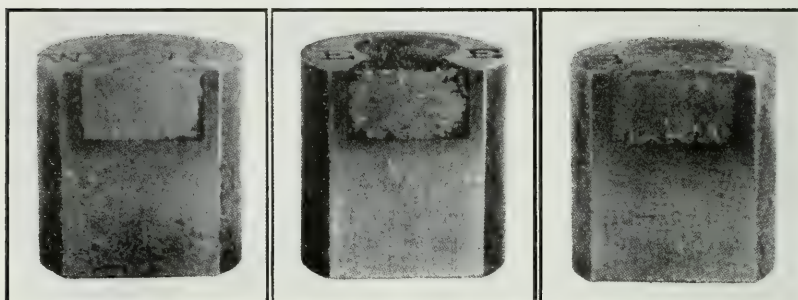


Fig 1.

Fig. 2.

Fig. 3.

Figs. 1, 2, 3. Photographs of Defective Amalgam Fillings Made with Dependable High-Grade Alloys.

During the period of my investigations immediately preceding the announcement to the profession of the importance of decided plasticity of the amalgam mass during the packing of a filling, more than 70 per cent. of the test fillings made for me by experienced operators showed defects that were readily apparent to the naked eye when one of the cavity walls was removed to permit examination; and fully 20 per cent. were as defective as the fillings shown in the above illustrations. Defects of this character, in every instance, are due to the condensation of a **dry mix**, a result of the forcible pinching out of the excess of mercury during the final kneading. The lack of plasticity in such a mass is manifested by a decided creaking of the amalgam during condensation. Such a mass will crack and break as it spreads, becoming so solid that it is impossible to compress it with sufficient force to eliminate these imperfections.

Upon removal of one of the cavity walls to permit examination.

#### Group 1.

12 test fillings made as in every day practice.

7 fillings presented defects sufficiently large to be apparent to the naked eye. All of which leaked when the fillings were subjected to air pressure.

4 leaked under a pressure of 2 to 4 pounds.

1 showed no leak at 10 pounds.

#### Group 2.

12 test fillings made by the same operators using the Standardized Amalgam Technic.

None of the fillings showed naked eye defects.

1 leaked at 3 pounds pressure.

4 leaked between 5 and 8 pounds.

7 showed no leak at 10 pounds.

10 pounds is the limit of air pressure to which I consider it proper to subject a filling immediately following its completion.

I present these as correct and beg to state that this report can be verified by those in attendance.

When experienced operators are made to see and know the character and extent of their amalgam failures, as described, their interest



is excited into the greatest possible effort to correct the fault. And, when following a two-hour talk and demonstration, so tremendous an improvement can be seen (as may be noted by a comparison of the two groups of tests), the merit of this method of instruction becomes apparent, and the value of the operative details presented by me is made conclusive.

My observations in the test work done for me have made it decidedly apparent that the reading of a paper fails to convey or explain; the rapidity of the rubbing in the mortar required to make a complete mix, also, what constitutes decided plasticity, tamping, thorough, forceful and orderly condensation. These operating details must be taught by actual demonstration followed by immediate practice.

The excuse for this paper is to urge the importance of a better understanding of these *vital points* and to further urge the necessity of their conscientious application if uniformly perfect results are to be attained.

The following may be considered as a standardized amalgam technic, to be followed in the use of *ALL* high-grade alloys, all of which are slow to amalgamate and set rather quickly. Alloys that contain less than 65 per cent. of silver do not belong to this class, and may be considered unreliable in some essential particular.

#### PROPORTIONS.

Proportions need not be exact but mercury should be plentiful, sufficient to avoid any trace of dryness in the mixing, and just within the other extreme of liquid plasticity. Either extreme is unfavorable to thorough amalgamation. When the proportions have been decided upon by a trial mix, it will save time and material to use the small amalgam balance sold for that purpose. The amount of mercury used in making a mix has nothing whatever to do with the excess mercury in the finished filling.

#### MIXING.

All high-grade alloys amalgamate rather slowly. It requires thorough rubbing of the particles in the presence of mercury to develop thorough amalgamation, conditions that prohibit a hand mix. Mixing is best accomplished by *rapid* rubbing in a deep mortar for a *minimum* time of *three* minutes, or a *minimum* time of one minute in the electric mixer. A measure of time is the only dependable guide to a thorough mix. At the end of the mixing period the mass should be sufficiently plastic to flatten out to about half of its diameter when rolled into a ball and dropped on the cabinet from a height of about four inches.

Thorough mixing is necessary to attain the degree of plasticity most favorable to adaptation.

It is also necessary to secure the greatest strength for the filling.

An incomplete mix will make an unstable filling by causing shrinkage or expansion in the finished filling in from one to nine months under the varying temperatures in the mouth.

The very plastic consistency described should be retained during the filling of the first two-thirds of all average large, and proximo-occlusal cavities, to insure adaptation in the use of high-grade alloys. This important requirement is best accomplished by temporarily retaining sufficient of the excess mercury (commonly removed during the final mixing and kneading), to be removed ultimately, after it has served its purpose, by tamping, forceful, and orderly packing, and the final packing detail, stepping the cavity walls.

The excess mercury generally removed during the final kneading is not dangerous, because this mercury is a surplus always removed by very ordinary packing. The excess mercury that requires our special attention is that excess mercury that only becomes apparent under thorough manipulation of the amalgam mass during the insertion into the cavity.

#### TAMPING.

Tamping has proved to be a very material aid in the removal of excess mercury, to uniform condensation, and adaptation. Tamping is done by lightly tapping each piece of amalgam placed in the cavity, with the plugger, until it spreads as a uniformly thick, dense, and plastic layer, in contact with the surrounding walls and well into the angles. This procedure provides uniform bulk and plasticity under each thrust of the plugger. Tamping in conjunction with forcible and orderly condensation seems to be the simplest and the most effective means for working out the excess mercury, and experience shows a decided improvement in stability, and perfection of adaptation, when this operative detail is carried out.

#### CONDENSATION.

The packing follows tamping and should be as forceful and thorough as possible, and applied with the greatest possible uniformity. The most practical means of accomplishing this in the mouth is by an *orderly stepping* of the plugger. Following the detail of tamping, we start the packing of each piece of amalgam with a medium or large plugger at the centre of the filling, stepping a little less than its diameter in *one* direction—outward in a gradually enlarging circle until the cavity walls are reached. The surplus mercury expressed is scraped off with the side of the plugger, and this surplus may be used for the finishing of the filling, by forcibly pinching out the fluid mercury to the point where you have remaining a rather stiff but workable mass, which is again tamped and packed, repeating the operation until the cavity margins are well covered with hardened amalgam.

#### STEPPING THE CAVITY WALLS.

The final condensation of each piece of amalgam is done by in-

clining the smallest plugger toward the cavity wall and stepping about half of its long diameter (size of plugger about 1.2 by 1.6 m.m. in diameter) immediately against the walls, and well into the angles *once* around the cavity.

With an orderly packing, the excess mercury is always driven in one direction outward, where it is at all times free to come to the surface to be removed.

The necessity for packing force and thoroughness has always been taught (though not sufficiently well applied), but the need for plasticity, tamping, and orderly condensation as applied to amalgam, are new thoughts or facts that *must* be accepted, to secure uniformity in results in adaptation, strength, and stability.

A filling unequally condensed is to the same extent unequal in its resistance to crushing stress and flow, strongest where it has received the maximum condensation, weakest where it has received the minimum condensation, little or no excess mercury where the filling has received the maximum condensation, and much excess mercury where it has received the minimum condensation. Excess mercury, always means mercury *unamalgamated*.

Excess mercury or an uneven distribution of that remaining, is equally fatal to the stability of the filling when exposed to the varying temperatures in the mouth. I again repeat: tamping, thorough, forceful, and orderly condensation, are the factors that will eliminate these troubles, that have proved unsurmountable in the use of the old amalgam technic.

Packing without order results in an uneven distribution of the mercury and in mercury pockets. A thrust of the plugger on one side of the filling drives the excess mercury to the other side, and a thrust on the other side of the filling drives much of it back again, and a third thrust between the two, pockets much of the excess and forces some of the excess mercury back into the amalgam previously condensed. To successfully remove excess mercury we must keep it moving in *one direction—outward* where it is at all times free to come to the surface to be scraped off with the side of the plugger.

Excess mercury (not zinc) is almost entirely responsible for the discrediting results developed by time in our amalgam work.

Excess mercury *must* be used to make a complete mix, and *must* be retained during the packing into the cavity, to make possible airtight adaptation to cavity walls. The removal of this necessary excess mercury *must* be accomplished *during* the insertion of the mass into the cavity, and this need will be found sufficiently well provided for in the Standardized Amalgam Technic I have presented.

#### THE MATRIX.

The heavy packing-force required to insure the complete removal of excess mercury makes the use of the matrix imperative in all cavi-



ties in which one or more of the surrounding walls are missing. The matrix may be held by l'gature, or by one of the mechanical retainers sold for that purpose. It should be held securely and should be reasonably well adapted to the tooth at all points along the cavity margins.

It is very much easier to avoid a large bulk of amalgam in the interproximate space, and an overlap at the gingival margin, than it is to trim off the excess during or after the setting of the amalgam. For this purpose, I insert a round, tapering, wood, toothpick from the lingual side to wedge the matrix solidly against the gingival margin. This wedge assists materially in preserving the interproximate space and saves much time in trimming the filling to form.

The matrix must be so held that it may be adjusted, or stretched, to permit restoration of the contact point when building the filling.

---

If, while making a filling, the amalgam mass becomes stiff, more mercury may be added and kneaded into the mass to secure the desired plasticity, when making large restorations, without impairing the strength of the finished filling.

It is not the per cent. of mercury contained in the finished filling that is important. It is the per cent. of unamalgamated mercury contained that does the damage.

Amalgam in its proper place is an indispensable filling material, the more desperate the case, the more desperate the need for its use. A non-leaking amalgam filling will never discolor tooth structure, and with the practical elimination of its most discrediting features, let us hope that we may be honored in its use, in its proper place.

I cannot permit this occasion to pass without the correcting of faults in adaptation, strength, and instability in our amalgam work. Because every-day observation in the dental office brings a sadder story, common in the use of all filling materials, but much more common in the use of amalgam, namely: Failure to make restoration of the interproximate space and contact form, and neglect in the trimming of rough overhanging margins. Indeed, in many instances, no pretence is made in this direction. This neglect is more serious in its consequences than the faults in the use of amalgam I have spent the past twelve years of my professional career to correct. Because, amalgam generally saves the teeth, notwithstanding faults in adaptation, strength, and instability. But failure to restore the interproximate space and contacts, to at least a reasonable degree, means the beginning of a gingivitis, to be followed by destruction of the septal tissues and the periodontal membrane, with all the possibilities of focal infection. Destruction of these tissues is irreparable, and commonly results in the loss of the tooth; in which event we may expect a general disturbance of occlusion, separation of teeth, with other serious consequences.



Overlapping and rough margins result in much trouble, and the very small amount of time required to make a reasonably good finish, particularly along the gingival margin, makes this neglect absolutely unjustifiable.

When amalgam is used in its proper place, or when used in an effort to bring our service within the financial reach of our poorer patrons, I plead that we make the best possible effort, that our valuable time will permit, to avoid the serious injury and destruction to the septal tissues and peridental membrane, by giving, at least, reasonable attention to the restoration of the interproximate space and contact forms, and to the smooth finishing of the margin along the gingival. *True professional service demands this.* These are operating faults,—not faults of amalgam.

---

## College of Dental Surgeons of the Province of Quebec

---

### PROGRAM OF MATRICULATION REQUIREMENTS FOR LEGAL AD- MISSION TO THE STUDY OF DENTISTRY IN THE PROVINCE OF QUEBEC.

---

To be legally admitted to the study of Dental Surgery in the Province of Quebec, the candidate must:

1.—From June, 1921, to June, 1927, (a) Present a certificate stating that he has successfully passed the special matriculation required by the Board of Governors, and that he is nineteen years of age, or else be a bachelor of arts, letters or sciences, (B.A., B.L., B.S.) (b) Hold a matriculation certificate from a recognized university of the Province of Quebec stating that he is regularly admitted to study Dental Surgery therein, because (a) he has completed in June, 1921, five years of classical studies (Belles-lettres for French university college, or four years high school, plus one year college for English university); in June, 1923, six years of classical studies Rhetorique in French university college or four years high school, plus two years college in English university); in June, 1925, seven years of classical studies (Philosophy Jr., or four years high school, plus three years college); in June, 1927, eight years of classical studies (Philosophy Sr.,) or four years high school, plus four years college; (b) he has successfully passed all examinations required at the end of each of above mentioned periods of study; (c) or he has made equivalent studies and successfully passed equivalent examinations before the matriculation Board of the university.

2.—After June, 1927, the candidate must: (a) Present a certificate stating that he has successfully passed the special matriculation examination prescribed by the Board, and is 19 years of age, or hold

a University diploma of B.A., B.S., or B.L., or (b) hold a certificate from University of the Province of Quebec stating that he has been regularly admitted to study therein, because: (a) He has completed eight years of classical studies or four years high school, plus four years college, (b) has successfully passed all required examinations, or (c) has made equivalent studies and has successfully passed examination thereon before the Matriculation Board of the University.

3.—In and after 1929 hold a bachelor's diploma from a university recognized in good standing by the Board of Governors.

For other information, apply to Dr. ALBERT DELORME, Secretary C.D.S.P.Q., 713 St. Catherine East, Montreal.

P.S.—From 1921 to 1923 inclusively, it should be understood that the candidate with a high school and a one year of arts certificate must pass the Board examination on Classics and one with a five years Classical Course certificate must pass the Physics.

---

### An Important Decision

---

THE Supreme Court of Massachusetts has just given a decision concerning a physician of that state which is worth noting. Dr. A. A. Lawrence, of Boston, is said to have committed an act which displeased the Board of Registration in Medicine, and the members of the Board asked him to appear before them and explain the matter. This he refused to do, and appealed to the court to prevent the Board taking any action in the matter, as he said he had been practising medicine for years before the Board was created and so had acquired certain vested rights, upon which the Board had no right to infringe. The case of appeal came before the Supreme Court, and that Court ruled that while the right of a physician to toil in his profession is recognized and must be guarded against all unwarrantable interference, yet this right is not absolute and must yield to the paramount right of the government to protect the public health by rational means. The Court said:—"A physician, however skilful, who is guilty of deceit, malpractice or gross misconduct in the practice of his profession, even though not amounting to an offence against the criminal laws, well may be thought to be pernicious in relation to the health of the community. It is for the Legislature to determine within reasonable limits in the exercise of the police power what the tests shall be for moral character sufficient to enable one to continue in the practice of medicine. He has no vested right to prey upon society by the exercise of deceit, malpractice or gross misconduct in the practice of his profession. His license to practice constitutes no contract of that nature." This assertion of the rights of society as overriding the rights of the individual is becoming increasingly common, and is well founded both in reason and in law.

# American College of Dentists

---

## STATEMENT OF OBJECTS AND REQUIREMENTS FOR FELLOWSHIP

---

EVERY important profession, science or art has its Academy, Legion, or Court of Honor, to which are elected, or appointed, those who have unselfishly devoted themselves to the advancement of each specific cause. This has been done not only as a just recognition of meritorious services, but also as an example to younger members that they may be encouraged to nobler efforts.

Recognition of the need of a similar influence in dentistry has resulted in the establishment of the American College of Dentists. The object of this College is to bring together in a group the men of outstanding prominence in the profession and by their united efforts in a field that is not now covered by any dental agency to endeavor to aid in the advancement of the standards and efficiency of American Dentistry. Some of the aims of the College are to cultivate and encourage the development of a higher type of professional spirit and a keener sense of social responsibility throughout the profession; by precept and example to inculcate higher ideals among the younger element of the profession, and hold forth its Fellowship as a reward to those who faithfully follow such ideals; to stimulate advanced work in dental art, science and literature; and to honor men who have made notable contributions to the advancement of our profession.

The enormously increased responsibilities of the dental profession to humanity on the one hand; the unprecedented opportunities for exploitation, which have resulted in a wave of mercenary practices that threatens to become a public scandal to the everlasting disgrace of American Dentistry, on the other hand, demand that those elements of the profession, whose character, reputation and professional attainments point them out as leaders, should be brought together for the purpose of checking the tide of destructive agencies and of encouraging by every laudable means the cultivation of that high spirit of professional and social responsibility, the wholesome influence of which is so greatly needed.

Inasmuch as there is no title or mark of distinction to differentiate the recent graduates from the practitioner who has devoted many years of faithful effort in the upbuilding of his profession, it is proposed that the Fellowship of the College shall be conferred upon two groups of practitioners, viz.:

1. Upon those members of the profession who have been at least ten years engaged in the practice of dentistry, whose efforts during that time have been loyally devoted to its ad-



vancement, and who are unquestionably looked upon as leaders in their respective communities. Time and effort devoted to teaching in dental schools, to presenting papers, or clinics before dental societies, or to organization and executive work of a constructive character, as well as public service or civic duties having a tendency to enlarge the usefulness or the public appreciation of dentistry, shall be taken into consideration when passing upon candidates of this group.

2. The conferring of the Fellowship shall be held out as a stimulus to young men to induce them to engage more earnestly in those activities which tend to advance dentistry as a profession and for which monetary remuneration must necessarily be sadly out of proportion to the time and effort expended. Devotion to teaching, especially in the non-clinical branches; to research work and to public education, as well as advanced work in the art, science or literature of dentistry, should be greatly encouraged as a consequence of this movement.

The candidate for the Fellowship in either class must be of good moral character, and have a reputation for ethical conduct and professional standing that is unquestioned. Personality, integrity, education, unselfishness, and high professional ideals, as well as freedom from mercenary tendencies, shall be considered in evaluating the qualifications of all candidates for the Fellowship.

---

### Dental Services—Department of Soldiers' Civil Re-establishment, Canada\*

---

THE various branches of the Department of Soldiers' Civil Re-establishment were organized as occasion demanded, and the Dental Branch was similarly the offspring of necessity. As the department increased the number of links in its chain of hospitals and sanatoria from coast to coast, the necessity of having its own Dental Branch become obligatory.

Prior to November, 1919, dental services rendered had been under the control of the Medical Branch, but as a result of representations made by leading members of the dental profession, the department decided that, to secure the best results, it was advisable to place dental services under a dental executive, which was done.

Plans were immediately adopted for placing in active operation an organization that would supply dental services where needed, and regulations to limit and control such services were formulated and approved.

\*Annual Report of Dr. O'Sullivan, Director of Dental Services, S.C.R., Ottawa.



## PERSONNEL.

The organization provided for a director, deputy director, and staff at headquarters, unit dental directors, dental surgeons in charge of clinics with subordinate staffs, and dental representatives.

Following the adoption of the regulations, clinics were established in rapid succession in the principal centres of the Dominion, and arrangements were made whereby dental services would be rendered under departmental supervision by civilian dentists in centres not sufficiently large to warrant the expense of a separate clinic.

## ELIGIBILITY.

Under the regulations of the C.E.F., any member of the Canadian forces was both eligible and entitled to dental services at the time of his discharge. Ex-Canadian soldiers at the time of their discharge were entitled to receive free dental services, and were presented with dental cards authorizing them to receive such services from the military dentists within a certain period after date of discharge. Various causes combined to prevent a large number of the discharged men from receiving these services within the stipulated time, and a few months ago an Order in Council was passed (P.C. 603) which provided, under certain conditions, for giving to those men who applied for treatment prior to the 1st September, 1920, the dental services to which they were entitled. These services are now being rendered by the Department of Militia and Defence.

Under the Department of Soldiers' Civil Re-establishment, which is a civilian institution, ex-members of the forces, who are on the strength of the department for medical treatment or vocational training, and in some instances men who are pensioners, are eligible to receive dental services, but do not become entitled to these services until other conditions have been fulfilled.

The Dental Branch of the department was established, not for the purpose of administering dental services to every ex-member of the forces who was taken on the strength of the department, but to serve, when necessary, as an adjunct in the restoration of such ex-members of the forces to normal health and strength. Those entitled to dental treatment by the department are:—

- (1) Ex-members of the forces on the treatment or training strength of the department. This class receives dental treatment only when it is indicated by the Unit Medical Director that such treatment will improve the man's general condition.
- (2) Ex-members of the forces who require dental treatment for repair of direct damage to the jaw or teeth resulting from war service. This class includes cases of recurrence of infected mouth due to service which require treatment for a toxic systemic condition, provided the medical examiner finds the general condition due to the recurrence of oral infection. These

men are placed in the same position as those suffering from any other physical disability due to service, and receive either full pay and allowances or are taken on the strength as out-patients, Class 2, being granted allowances for the time lost in attending for treatment, according to the circumstances of the case.

- (3) Ex-members of the forces referred to the department by the Board of Pension Commissioners when it is considered that dental treatment is necessary to lower pensionable disability.

The privilege extended to ex-Canadian soldiers of free medical services for a period of a year after date of their discharge does not apply to dental services.

#### CLINICS.

In addition to providing services at the main clinics for out-patients, dental operators attended to the needs of departmental in-patients of ninety-eight institutions, as follows: "A" Unit, 13; "B" Unit, 6; "C" Unit, 10; "D" Unit, 15; "F" Unit, 12; "G" Unit, 8; "H" Unit, 6; "I" Unit, 11; "J" Unit, 11; "K" Unit, 6.

#### CIVILIAN REPRESENTATIVES.

Coincident with the opening of dental clinics, civilian dentists were appointed as dental representatives to the number of over one hundred and eighty (180), and these have supplied the necessary treatment in their localities, functioning from Victoria to Halifax. They proved particularly essential to a large number of ex-soldiers who, as out-patients, were referred by the Unit Medical Directors for dental services.

#### TYPE OF WORK.

As in the army, dental services are limited, as a rule, to cement and amalgam fillings, extractions and ordinary vulcanite dentures. Under certain conditions, vulcanite dentures with one or two teeth are unserviceable, and in these cases, bridges are provided. Provision has been made to meet the wishes of those who are entitled to receive only vulcanite dentures, but desire bridgework, the patients paying the difference in cost between the work to which they are entitled and that not chargeable to public funds.

The dental division of the department is opposed to making fixed bridges for tubercular patients and also discourages the insertion of gold fillings, a policy which has occasionally been adversely criticized.

Two reasons exist for opposing fixed bridges: (a) a bridge must necessarily have a support at each end, and, in the case of a dental bridge, these supports are natural teeth; e.g., three teeth, called dummies, are placed between the supports, which means that the bridge consists of two supports to bear the stress and strain of mastication for five teeth. The vitality and natural powers of resistance of certain patients, particularly those suffering from tuberculosis, are undoubtedly

below normal, and for such patients any unnecessary stress must be avoided. For somewhat similar reasons, gold fillings are not advisable, and every observing dental surgeon knows that an analogous condition exists at certain periods of girlhood and womanhood when operations involving crowns, bridges and gold fillings should be postponed and devitalized teeth carefully watched. (b) Vulcanite dentures can be readily removed and washed, whereas it is sometimes extremely difficult to maintain fixed bridges in a sanitary condition.

Dentists in charge of services for tubercular and mental patients need to be possessed of special characteristics, and the department is fortunate in having on its staff operators who are enthusiastic about such work and are cordially liked in the institutions. Patience, tact, ability to be a "good mixer" are requisites for success in getting work performed, as those patients are nervous and cannot be given long sittings at any one time. The amount of work accomplished can never be regarded as a criterion of the time consumed by the operator, as the keeping and length of engagements are very problematical, being dependent on the physical condition of the patient at any special hour.

Direct dental injuries to the jaw or teeth by gunshot wound or similar causes receive the same consideration as any other physical disability sustained on service. Unstinted care and expense are bestowed in rendering the necessary restoration in such cases.

#### RECIPROCAL SERVICES.

By mutual agreements between the Imperial, Newfoundland, United States, New Zealand and Canadian Governments, provision has been made whereby ex-soldiers of the one country receive, when resident in the other country, treatment, including dental services, for disabilities due to war service. In this connection, it must be noted that under arrangements with the Imperial Government, dental services for ex-British soldiers resident in the United States are under the administration of the Department of Soldiers' Civil Re-establishment. Dental services by the Department are provided, according to the regulations of each of these countries, for,—

- (a) *Ex-members of the Canadian Forces in Canada.*—As already outlined.
- (b) *Ex-members of the Canadian Forces in the United States.*—Through the Bureau of War Risk Insurance, Washington. Prior to rendering dental services (except in emergency cases), the authority of the department must be obtained.
- (c) *Ex-members of the Imperial Forces in Canada.*
- (d) *Ex-members of the Imperial Forces in the United States.*—Through the Bureau of War Risk Insurance. All requests for dental services must receive the sanction of the department before accounts for such services are recognized and paid on behalf of the Imperial Government.



- (e) *Ex-members of the American Forces in Canada.*—Dental services for the above are authorized by the Bureau of War Risk Insurance, Washington, and all accounts for work performed are submitted to the Bureau for payment.
- (f) *Ex-members of the Forces of Other Countries.*—Dental services are also rendered to ex-soldiers of sister colonies and other allied nations, when duly authorized by properly accredited representatives.

#### THE NECESSITY FOR DENTAL SERVICES.

The importance of being dentally sound loomed large early in the war when recruits presented themselves for enlistment and men, otherwise fit, were rejected until their dental disabilities were corrected. Since then the conviction that a patient must be dentally sound before other desired results can be obtained has become paramount.

Large amounts of money have been expended by the department in the construction of hospitals and sanatoria, the most up-to-date methods of cold storage have been installed, the supply of pure water has been assured, and the skill of the dietitian obtained for ex-soldier patients. To crown these efforts with success, the dentist takes charge of the last chamber in which the food is placed. The power to grind or masticate the food is restored, where lacking; mouths that were hot-beds and breeding places of infection are made healthy, the net result being that the food, uncontaminated by the health destroying bacteria of the mouth, passes, after mastication, through the process of digestion and culminates in the production of pure blood without which the fountains of health and strength are depleted and the essential factors of health and strength irrevocably lost.

The work of dental surgeons has, in the last few years, extended over a wide field and is no longer limited to extractions, dentures, bridges and fillings. The big problem of the moment, in both the medical and dental professions, is the question of just what diseases are of dental origin. Pathologists now concede that certain heart, joint and kidney infections may be regarded as one disease, and are largely of mouth origin. Quite an army of the best family physicians now demand a dental diagnosis just as soon as they are unable to determine the exact cause of a patient's physical disorder.

#### INSTRUCTION TO PATIENTS.

Scientific investigations have shown that the difference by weight and count in the number of bacteria per milligram of tooth scrapings in dirty mouths to that of reasonably clean mouths will range from eight hundred millions in the dirty mouths to not more than eight millions in the clean mouths. Ten or fifteen minutes each day, spent in effective mouth sanitation, will produce the safe minimum of bacteria, and medical superintendents of departmental institutions have given their hearty and active co-operation to the dental staff in



the efforts of the latter to inculcate the habits of dental cleanliness. Prophylactic tooth brushes and mouth washes are provided for the patients, and the habit of proper cleansing of the teeth throughout the day is rapidly gaining ground.

#### DENTAL SERVICES FACTOR IN RESTORATION OF HEALTH.

Very interesting results have been obtained where dental treatment for inmates of institutions was practically the sole factor in restoring patients to normal health, particularly where myalgia, neurasthenia, and cognate ills were indicated. The high regard in which dental treatment is held has been enhanced by outstanding results obtained in some of the tubercular institutions.

The reports of Dr. H. A. Farris, Medical Superintendent of the Saint John County Hospital, on three patients are worth quoting:—

“Major ——— was sent here with a diagnosis of pulmonary tuberculosis. I gave him a very thorough examination, and had his chest X-rayed, but could find no evidence of pulmonary tuberculosis. He had a cough, fatigue, pains and afternoon temperature. I had to send him out with a diagnosis as non-tuberculous and symptoms of unknown origin. Dental examination, however, showed his teeth in bad condition. His teeth were removed and he has been in good health since.

“Ex-No. ——— was sent here with a diagnosis of pulmonary tuberculosis. He was tired, feverish, and ailing generally. I could find nothing in his chest. I X-rayed his teeth and found a large root abscess. He was discharged as non-tuberculous. He had his tooth treated, and it was remarkable how much he improved.

“We had one civilian patient, Miss ———, who had pulmonary tuberculosis, but in spite of continued improvement of her chest, she ran an evening fever of nearly 100 for many weeks, till finally one tooth gave her some trouble, and the dentist pulled the tooth for her, and her temperature dropped to normal immediately, and within six weeks we discharged the patient in good condition.”

The S.C.R. Dental Clinic at The Mountain Sanatorium, Hamilton, has rendered invaluable assistance in the treatment of tubercular patients.

Dr. J. H. Holbrook, physician-in-charge, emphasizes the importance of dental services in the following few, selected from many, reports:—

“Major ——— was admitted to the Mountain Sanatorium on January 2, 1917, and discharged June 19, 1918. X-ray of teeth showed an apical abscess on July 23, 1917, and this tooth was extracted. Previous to this, temperature had been slightly above normal almost daily, and following extraction there was considerable improvement, temperature being normal for several days at a time. When a dentist was permanently appointed to this institution, he examined this patient and expressed doubt as to the condi-

tion of one other tooth, and this was X-rayed, showing slight abnormality at the root in April, 1918. This tooth was then extracted and temperature remained normal from that date to time of discharge on June 19, 1918.

"Lung condition on admission showed a very definite lesion at the right apex with marked consolidation and with signs indicative of cavitation. Lung condition remained fairly stationary till first tooth was extracted, when improvement set in. Improvement was more marked after second extraction, and we consider that it is a possibility that the infection from the root abscess was carried by the blood to the lung, where it localized, leading to the breaking down of an old healed condition at the apex of the right lung. In any case the lung condition remained practically stationary until the tooth was extracted and improvement was very rapid after extraction of the second tooth. Major — has now been discharged two and one half years and is "carrying on" as head of the firm of — Company."

"Ex-Pte. — was admitted to the Mountain Sanatorium on March 27, 1918, and discharged December 9, 1918.

"He ran a temperature continuously for several months, and while he had extensive impairment of resonance in the lung, yet we were never able to find chest signs indicating active trouble. His temperature was so persistent and so regular that we considered that it was not typical of tuberculosis. Accordingly we advised X-ray examination of the teeth, with the result that focal abscesses were discovered, and after this condition was completely cleared up, the temperature had come to normal, and, apart from a slight rise, which can be accounted for by other causes, temperature remained normal after teeth were extracted."

The following is an extract from a letter written by Dr. Holbrook, under date of the 14th December, 1920:—

"We now make it a routine to have every man's teeth examined as soon as he is admitted and, if there is anything suspicious, he is at once sent to the X-ray room. As a result, these conditions are cleared up very soon after admission. We could report several other cases that had shown abscessed teeth, and had been under treatment in other institutions, or in poor health for a long time previous to admission, but cannot give the results so definitely as in these cases that came directly under our observation.

"We wish to say that we believe that focal abscesses can lead to localized lung disease and can even lead to the breaking down of an old healed tuberculous condition, and that such cases are not likely to do well under sanatorium treatment until the dental conditions are first cleared up."

At the annual meeting of "The Canadian Association for the Prevention of Tuberculosis," held in Vancouver last summer, the

general opinion expressed by experts present was that a dentist should be attached to every tuberculosis institution, and an address by Dr. J. R. Byers, Medical Superintendent of the Laurentian Sanatorium, showed conclusively in what manner diseased teeth may prove to be a factor of moment in the production of lung and other diseases, that such "teeth afford a haven for disease germs which propagate rapidly, that the resulting poisons are absorbed into the system, and that results of a disastrous nature occur in distant fields either as a result of these poisons, or more disastrously as a result of the actual germs getting into the lymph or blood streams."

### FACIAL WAR INJURIES.

In addition to treatment for systemic conditions and operations involving fillings, dentures and bridges, a new type of dental work, resulting from war injuries, has arisen, requiring delicate, skilful, and painstaking manipulation and taxing the mechanical and artistic ingenuity of the dental surgeon.

With very few exceptions, all special jaw and facial cases, have, until recently, been attended to by the dental clinic at the Dominion Orthopaedic Hospital, Toronto, with Major Campbell in charge, and at the R.C.D.S., where Major Cummer was supervisor of the work.

The following data were obtained from Major Campbell prior to the transfer of the Dominion Orthopaedic Hospital from the Department of Militia and Defence to the Department of Soldiers' Civil Re-establishment on the 1st November, 1920:—

Class 1.—Total number of casualties of this kind approximately .....	2,000
Class 2.—Total number of patients supplied with complicated prostheses .....	500
Class 3.—Cases in hospital under treatment or on leave pending stages of operation .....	46

Class 1.—The greater number of these cases has been completed and finally discharged. But in some instances the lower prostheses of these men will have to be remodelled. Many of these cases could be attended to by ordinary dental services.

Class 2.—In these cases prostheses have been constructed which are complicated, necessitating much practice and experience, and will from time to time require apparati to be constructed. This class is made up of those men having lost part of mandible, in two cases all of this bone. Others having lost half, have mechanical arrangements to supply loss of condyle or bone substance to allow remaining portion of jaw to be of some service. Also cases in which all or part of superior maxillae have been lost with consequent loss of speech. Many of these latter cases, although unable to eat ordinary diet, are put in such condition that speech is possible, sometimes normal. Well cooked foods can be eaten with comfort. These types, for all time, owing to tissue changes, require attention.



Class 3.—Cases in hospital. Most of these are purely facial cases with dental work fairly completed. There are a few cases still awaiting bone graft of mandible who will require prostheses. Of the 123 men discharged since December, 1919, a few of the later cases, 20 in number, have not had final prostheses constructed dependent on the fact that bone grafts had not become stabilized.

#### EQUIPMENT AND SUPPLIES.

The major portion of the heavy equipment was obtained in the various units by transfer from the Militia and Defence clinics. Dental consumable supplies do not occupy much space and are of comparatively light weight. It was, therefore, decided that instead of having three or more stores in various centres, one central store at 185 Spadina Avenue, Toronto, would be quite sufficient to supply all units, thereby reducing stores' staff as well as other overhead expenses to a minimum. The expert advice of an experienced dental storekeeper was obtained for the installation of shelves and the grouping of supplies, with the result that central dental stores is regarded as one of the model stores in the department.

The union of medical and dental stores, under the personal supervision of the medical storekeeper, was proposed, but was found impracticable owing to the great dissimilarity between the stores concerned and the fact that a storekeeper with the requisite training for both classes was unavailable. The list of dental consumable supplies includes nearly three hundred articles, and to these are added various types of equipment.

#### REPORTS.

Control and intimate knowledge of the various clinics and all phases of dental services are maintained by a system of reports, which are classified under daily, weekly, monthly and quarterly. These provide the ex-number, name, ex-unit, address and disability of each patient and detail the work performed. Returns are made of the equipment and consumable supplies, enabling head office to enforce a close check on expenditures. Reports are used in connection with the work performed by civilian representatives. After an application is received, the applicant's eligibility must be established before the type of work required and cost of same are considered and every care is exercised to safeguard the expenditure of public funds. Returns of the operations performed in the clinic provide the means of checking the work of each operator.

In addition to the reports forwarded to head office for work performed in Canada for ex-Canadian soldiers, reports are forwarded for work performed for ex-members of the Imperial forces, United States forces and other countries with which reciprocal arrangements have been made. The reports forwarded from the United States are very numerous, as the Dental Branch is responsible for dental work in



the States for not only ex-members of the Canadian forces, but also for ex-members of the Imperial forces, and ex-members of forces of other countries with which arrangements have been concluded.

CORRESPONDENCE.

As an indication of the amount of letter-writing required, 5,037 official letters have passed out from the dental division in the past nine months. Of these, 798 were written to the Bureau of War Risk Insurance, as follows: Canadian, 564; Imperial, 200; American, 24. In connection with dental correspondence at head office, the file of each individual whose case is being considered is drawn from the Central Registry, examined for the desired information and returned. During the past nine months 6,000 such examinations have been made. A card system is in force which records the files drawn and their disposal.

DENTAL SERVICES RENDERED IN ALL DEPARTMENTAL CLINICS  
FROM JANUARY 1, 1920, TO DECEMBER 31, 1920.

Amalgam fillings .....	18,441
Temporary fillings (a) G.P. (b) Cement .....	6,405
Cement fillings .....	7,528
Treatments putrescent pulp .....	16,871
Root fillings .....	2,899
Pulp cappings .....	2,146
Devitalizations .....	2,914
Pyorrhea and trench mouth treatments .....	8,503
Impressions .....	8,351
Bites .....	6,117
Try-ins .....	5,555
Synthetic porcelain fillings .....	5,150
Repairs of dentures .....	2,462
Prophylaxis .....	11,195
Extractions .....	19,704
Anaesthetic, general .....	528
"    local .....	10,253
Dentures, upper .....	1,743
"    lower .....	1,045
"    partial .....	3,349
Gold clasps .....	5,677
Examinations and mouth charts .....	16,517
Total operations .....	163,353

DEPARTMENTAL PATIENTS TREATED BY OTHER THAN DEPARTMENTAL SALARIED DENTISTS FROM JANUARY 1, 1920,  
TO DECEMBER 31, 1920.

In Canada—	
Ex-Canadian soldiers .....	665
Ex-Imperial soldiers .....	71
	736
In United States of America—	
Ex-Canadian soldiers .....	12
Ex-Imperial soldiers .....	6
	18
Total patients .....	754

# THE COMPENDIUM

This Department is Edited by  
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING  
TO THE SCIENCE AND PRACTICE OF DENTISTRY

## INTERMITTENT PAROTID SWELLING CAUSED BY ARTIFICIAL DENTURE.

**S**UDDEN enlargement of the parotid is not common. The British Medical Journal records four cases in adults, a report of which is given in The British Journal of Dental Science October, 1920.

The enlargement almost always occurs after the first meal of the day, and rapidly increases during mastication; its subsequent development varies with the character of the food and according as it is a primary attack or a relapse. There is interference with the movements of the jaw and sometimes pain, which is acute for the first half-hour and afterwards dull, like that of mumps. Contrary to what is found in mumps, however, on pressure of the gland a distinct lobulation can be felt, and occasionally a hard cord of the size of a pencil; this is Steno's duct. Pressure on the gland causes expulsion of a plug of mucous followed by a flow of saliva. The affection usually starts during the first week that a denture is worn, but it may occur later. It may last for several days, but usually disappears more or less completely on the first day and reappears the next day and for five or six days in succession. After an interval of a month or six weeks it recurs as a result of a chill, the irritation of food, or the onset of menstruation. The condition is due to the denture causing inflammation of the gums, which spreads to the orifice of Steno's duct and so causes retention of saliva. Cure is effected by removal of the denture, and subsequently by its careful adjustment, together with the use of a potassium chlorate mouth-wash.

## FILLING ROOT CANALS.

**A** REVIEW of the recognized methods of root canal filling is given in the January issue of "L'Odontologie" by M. Lubetzki. Taking up, first of all, the conditions necessary in order to insert a good root-filling: The field of operation must be aseptic and dry. Adjust the rubber dam before attempting to re-

move any of the material which temporarily fills the tooth. Open up the cavity in order to get easy access to the canals. The canals are well enlarged by chemical methods: (1) Sulphuric acid (Callahan's method); (2) sodium dioxide (Szigmondy's method), or by mechanical means, Kerr's broaches and Beutelrock's.

Canals must be perfectly cleansed after devitalization, whether by the slow or immediate method; no pulp debris should remain, nor any trace of coagulated blood; after careful treatment of septic pulps, broaches used for cleaning the canal should not show any trace of infection.

Having thoroughly cleansed the canals, the operation of filling them may now be proceeded with. The filling materials used for this purpose should possess the following properties:

(1) *Antiseptic*, to maintain the canal in a state of asepsis and to continue the struggle against micro-organisms which might remain in the canaliculi.

(2) *Impermeable*, in order that the filling may not be penetrated by any liquid coming from outside, bringing bacteria with it.

(3) *Permanent*: No contraction or expansion should be in evidence.

(4) *Plastic*, in order that they may be easily introduced into the canals.

(5) *Easily removed* in case of secondary infection.

(6) *Malleable*, that is to say, they can be made to penetrate into the finest and deepest recesses of the canal.

Various materials have been used in the effort to meet the foregoing requirements. These may be classified as: (1) fibrous; (2) metallic; (3) plastic; (4) paste. The first are wool, silk and flax; they offer no guarantee of asepsis, and should not be used. In the metals, gold wire has been used, also cohesive gold and amalgam. Wire does not fill the canal perfectly, cohesive gold is very difficult to insert. Amalgam may well serve to fill certain roots, but a portion of the canal should first be filled with an antiseptic paste or gutta percha. The best materials, however, are found amongst the plastics and pastes. These two materials can fulfill the indispensable conditions of completely filling the canal.

#### *Plastic Materials.*

(1) *Oxy-chloride of Zinc* gives excellent results. The disadvantage of solution when in contact with lactic acid in the mouth is not in evidence when it is used as a root filling. Its antiseptic qualities are taken advantage of, it diffuses everywhere and coagulates albumins. Introduced as a very liquid paste, it can fill the canal. It is caustic and so may give rise to irritation of the peridental membrane at the apex. To obviate this, fill the apex with a gutta percha cone or a little absorbent cotton wool saturated with thymal; then one may fill the canal with oxy-chloride of zinc; cotton wool in contact with chloride

of zinc is converted into an amyloid material, thus filling the apical foramen thoroughly. However, this material has been partially abandoned on account of its hardness, which makes the removal of the filling difficult.

(2) *Chloro Percha*. Dissolve gutta percha in chloroform to the saturation point. With broaches, bathe the sides of the canal with the solution, and some is also placed in the pulp chamber; the latter is forced into the canal with a wad of cotton wool. The advantage of this substance is that the finest canal can be filled to the apex.

The disadvantages of this method are: (1) insufficiently antiseptic. It can, however, be made antiseptic by replacing the chloroform, which evaporates, with eucalyptol; (2) it contracts around its central portion, so that a space exists between the mass of the material and the wall of the canal. This may be partially overcome by inserting a gutta percha cone.

(3) *Paraffin*. By itself this is not antiseptic, but it may be made so by the addition of salol, thymol, paraform, etc. The paraffin is placed at the orifice of the canal, and pushed into the canal with a copper wire mounted on a galvano-cautery; the paraffin is melted, runs into the canal and fills it. The openings of the canals are covered with cement or gutta percha.

(4) *Gutta percha*. This material is used in the form of very fine cones, after having been dipped in chloroform. As they are always too long, they are cut off with a heated instrument that has been dipped in vaseline. The cone is pushed into the canal with special instruments, at the same time warm air is blown upon it. To fulfill all the requirements of a good filling, it is necessary to line the walls of the canal before putting in the gutta percha with an antiseptic paste, which will come in contact with the dentinal tubuli.

(5) *Pastes*. To overcome the lack of essential properties of the materials mentioned above, the method of filling canals with a paste composed essentially of antiseptics has been advocated. These pastes are antiseptic on account of the Therapeutic agents which they contain; they are plastic, which allows them to be introduced into the canals. They can be easily removed. Unfortunately they have these disadvantages: (1) As they dry they contract, and do not fill the canal perfectly; (2) being too liquid, they are not sufficiently impermeable. The formulae of three of the many pastes advocated are given below:

1. *Witzel's Paste*.

Zinc oxide, 4.

Aristol, 1.

Oil of cloves (to make a thick paste), q.s.

2. *Ferrier's Paste*.

Oxide of zinc

Trioxymethylene

} Powder.



Formol.	}	Liquid.
Eugenol.		

3. *Buckley's Paste.*

Oxide of zinc, 8.  
 Sulphate of zinc, 2.  
 Tricresol, 3.  
 Formol, 1.  
 Eugenol, 1.

Glycerine (to make a thick paste) q.s.

Oxide of zinc is used as a vehicle, as the antiseptics alone might irritate the peridental membrane.

*Methods of Introduction of Pastes.*

1. The canals are dried, but this should not be exaggerated, for fear of causing fracture of the crown.
2. Lubricate the sides of the canals with an antiseptic.

All the antiseptics used in dentistry have been advised for this purpose, but those, such as chloride of zinc, formol, tricresol-formol, and thymol, fixers of a large number of organic products, are most recommended.

The effect of a lubricant is to allow the paste to enter the canal more easily, and be drawn down as far as possible, and, of course, care must be taken that no germs enter canals considered to be perfectly aseptic; and, to obtain the maximum of success, instruments, glass slabs, etc., should be sterilized and then burnt with alcohol.

Two kinds of pastes are used: one of liquid consistency, to lubricate the canal, and another thicker, which is placed at the entrance to the canal on broaches and forced into the canal with a pledget of cotton. The patient may now have a painful sensation at the apex; this is more likely due to a cushion of air enclosed in the canal than to the passage of paste through the apex. A smooth probe is passed in the canal to allow the air to escape from the canal and the filling of the canal with the paste is completed.

To overcome the permeability of pastes, the latter is covered with gutta percha or cement, which can easily be removed if necessary.

Often in upper molars, canals are curved and cannot be enlarged mechanically for fear of making a false canal. In this case the tooth is left longer for observation, and then one proceeds as before, taking care not to cause pressure on remains of pulp filaments. In the case of false canals, these should be filled with copper amalgam before the usual canal filling is done. —*Reported in The Dental Record.*

A RELIEF FOR BONY VAULTS IN FULL UPPER DENTURES.

**I**T is a matter of common observation that many dentures lose their suction after they have been worn for a short time. Many claim that this is due to the denture impinging too severely on the bony ridge in the vault of the mouth. The old-time large suction chamber, though designed to create suction, really acted as a relief for these hard bony ridges.

All operators are agreed that a relief must be provided for these bony prominences if the denture is to prove successful; but there is no unanimity regarding the proper method to be used in accomplishing this. Some take the position that the relief should be provided for on the model; others provide for it on the completed denture.

In "The Pacific Dental Gazette," Dr. A. Lockwood takes up this subject and suggests a remedy that is reliable and does away with all guesswork. First, before taking the impressions, carefully examine the mouth with your finger; determine the extent and shape of the bony ridge. Now take some tinfoil and cut to approximate the bony part. Place it in the mouth and burnish it over the part. Keep trimming it until you are certain by digital manipulation and feeling that it covers all the bony part and no more. Now, remove it and fold a piece of tin-foil a sufficient number of times to make it the required thickness of the relief. You determine this by the yielding of the surrounding soft tissues. The softer the tissues the greater should be the relief. When you have secured tin-foil of the required thickness, place the pattern of tin-foil that you have previously fitted over the bony part and cut a new piece exactly to this pattern. Now dry the vault over the bony part, wet the tin-foil and burnish to place. Better burnish the relief first, to be sure you have it where it is needed; then wet and apply powdered gum tragacanth to the palatal side of the tin-foil and stick it into place. Now take the impression. If using the Greene system, the tin-foil will stay in the impression through all the subsequent manipulations to obtain muscle trimming, etc. When the impression is ready to cast, first remove the tin-foil. The model will then have suitable relief sections to take care of the bony portions in the palatal vault.

#### OBSERVATION ON DENTAL THERAPEUTICS, BASED ON CLINICAL AND ROENTGEN-RAY INVESTIGATIONS.

THE following report of Dr. W. M. Fine's paper, as published in "The New York Medical Journal," is given in "The International Journal of Orthodontia":

In the author's opinion, too many teeth are extracted with a view to curing some obvious systemic disturbance, including that of the nervous system. For a few years past he has witnessed the wholesale extraction of teeth, without noting a recovery from many of the diseased conditions attributed to the teeth. The successful demonstration of the same micro-organisms in pulpless teeth and in arthritic joints does not necessarily mean that the teeth are the primary cause of the infection in all cases. On the contrary, the evidence rather points to the systemic disease as being responsible for the dental disturbances, although it is true that the extraction, or the restoration to health, of badly decayed or abscessed teeth removed a contributory factor in many diseases, and also true that many diseases can be traced directly to mouth infection. Non-vital teeth should not be unconditionally removed, for the loss of the capacity of proper mastication of the food

involves a greater danger than that arising from a correctly treated dead tooth. It is doubtful, moreover, whether all of the clear areas shown by radiograms of dead teeth are abscesses, and if this is not the case such teeth should not be ruthlessly extracted. Bone-absorption may easily be produced by forcing filling material through the end of the roots, or by drugs used in dentistry, such as creosote, oil of cloves, or carbolic acid, resulting in the production of a clear area, and it is highly probable that seventy-five per cent of such areas have been caused by such operative technique or by a defective film. When the radiogram shows a liquefaction of the tissues, it is a plain duty to open and drain, and when there is a great deal of destruction of bony tissue, due to the abscess, it necessitates extraction. There are teeth that cannot be successfully operated upon, and canals that cannot be found or opened. Such teeth must be removed when they become the seat of infection.

#### SILVER NITRATE IN ROOT RESECTION.

ONE of the difficult features attending the surgical technic of apicoectomy is the successful treatment of the exposed root end. The problem of preventing or reducing the susceptibility to further resorption is a difficult one.

Many schemes have been resorted to in order to protect the vulnerable root ends, which are left exposed after the surgical treatment. Amalgam has been used with more or less success. Encapsulation with gutta-percha has been used; filling the apical end of the canal with gold has been tried; filling the whole canal with lead canal points and after resecting, burnish the lead over the end, has been practised. All of these methods seem to have met with objections. All apparently have failed to completely seal over the exposed root end.

Dr. Chalmers J. Lyons, of Ann Arbor, Michigan, in a paper read before the National Dental Association and published in the "Pacific Dental Gazette" of May, 1921, suggests a method of reducing silver over the exposed ends. It seems to meet the requirements of completely sealing over the end of the root, and apparently does not in any way interfere with the process of repair. The following method is suggested:

The resected ends are sealed with rapid reducing silver, made up as follows: to a 10 per cent. or 15 per cent. solution of silver nitrate, enough potassium hydroxide or sodium hydroxide is added to convert all of the silver present to the oxide. The oxide is carefully washed with distilled water and placed in an amber-colored bottle for future use. When not in use, the silver oxide should be kept in a dark place to prevent reduction.

When rapid reducing silver is desired, the oxide is carried with a glass rod into a drop or two of pure ammonium hydroxide until the fumes of ammonia are no longer noticeable. (The silver-ammonium-oxide solution is amber-colored.) It is applied by suitable glass



pipettes to the dry resected end of the tooth. It is left there for from three to five minutes, after which a small amount of some reducing agent, such as eugenol, or a 2 per cent. solution of formalin is added and left for one minute. The excess is removed and the resected end is burnished with a warm burnisher. This treatment may be repeated until there is a dense black layer of silver deposited over the root end.

All the unused silver ammonium oxide should be discarded immediately after use, because of the possibility of forming explosive fulminates of silver.

#### EXODONTISTS: TWO CLASSES.

WHEN exodontists are considered, they must be divided into two groups. We are going to admit, without any argument, that all exodontists exist for the purpose of extracting teeth, but we find one class of these specialists existing only for the purpose of extracting teeth at so much per tooth. These men lose all interest in the patient's future welfare as soon as the tooth is out. They who are only interested in exodontia from the purely monetary standpoint do not admit that they owe anything to the profession or the public save the extraction of the tooth marked on the card or desired extracted by the patient, regardless of what other branches of dentistry may think of the future demands for the tooth as a part of the dental apparatus. These men extract teeth because someone has referred the patient to them; then they try to switch the responsibility to the dentist, even when their knowledge as a specialist indicates that the tooth should be saved. These exodontists justify themselves by saying that they must get their business from the medical and dental professions and, therefore, cannot afford to take the chance of giving the patient the benefit of their wide experience by suggesting anything that the general practitioner has not ordered. Specialists who shirk responsibility like this are a greater detriment to the profession than those who err because of the lack of knowledge.

Fortunately there exists another group of exodontists who are working for the professional advancement of their specialty by placing the interests of the dental profession and the public above the mere gaining of wealth. There is no question in our minds but that the second man will eventually outstrip the first, even in the gathering of wealth, and will occupy a better social position in the community, because he has given his best. We believe there are enough men in the dental profession sufficiently interested in the welfare of the public to refer business to the ethical exodontists, so that these specialists can serve the public as it should be served without sacrificing their better judgment. The slogan of a certain club is, "He serves most who serves best," and this applies particularly to the specialty of exodontia and the man who puts the interests of the public foremost.

—*Editorial, Journal of Orthodontia.*



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

THE DEFINITION OF DENTAL ESTHETICS has been suggested by the Committee of the N.S.D.P. as: The science which deduces from nature the rules and principles of facial and dental art.

Quoting again from the report of the Committee on Esthetics and Art: "Good art demands that in any one composition there can be only one dominant theme. In our application of this law the outline of the face seen full front in repose, is the major premise of the composition.—*Dental Digest*.

TO HOLD BROACHES IN THE FINGERS.—To enable nerve broaches to be manipulated by the fingers rather than use a broach carrier, from a stick of shellac melt a little on warmed end of broach and twirl between fingers. You will then have a first-class grip of broach.—*T. Cornwall Williams, (Dental Science)*.

TAKING IMPRESSIONS FOR INLAYS.—In taking impressions for inlays, oil the wax, and see how much smoother the inlay comes out.—*P. Chater Charlton, D.M.D., L.D.S., Eng. (Dental Science)*.

HOW TO DO IT.—To clean trays of modelling compound soak in concentrated ammonia for fifteen minutes, and tray will look like new.—*Dental Digest*.

TO BURNISH ALUMINUM.—For this purpose use Olive Oil and Frum (on the plate).—*Gordon C. Barkley, D.D.S., Sydney (Dental Science)*.

VULCANITE DENTURES.—It sometimes happens that a little piece of red rubber comes through the pink on the labial part of the gum, and so spoils the appearance of the case. Bur this out, leaving the edges defined and slightly undercut. Have the cavity a definite shape, round or square. Next get a piece of old pink gum which has been vulcanized, and cut it to the size of the hole, or very slightly larger. Hold this on a spatula over the bunsen burner (do not burn it), and while warm force it into the cavity. Hold firmly till it is cold, then smooth off and polish.—*Gordon C. Barkley, D.D.S., Sydney (Dental Science)*.



## The Patient's Point of View

WE hear matters discussed in dental meetings affecting the relationship between dentists and their patients and also many remarks in conversation in which the patient's point of view is apparently forgotten or ignored. Men figure out in mathematical precision just how much each hour should net them in practice, just what the overhead is, and just what their "salary" should be. (I hate that word "salary" when applied to a professional practice.) All of this is very laudable and proper so far as it relates to a systemic regulation of one's affairs, and as a means of finding out where there are possible discrepancies in the management of the office. But when men sagely sit with pencil and paper and figure precisely what each hour must bring them willy-nilly, and then start out to apply it rigidly to their practice, they are ignoring one of the fundamental essentials to success. That essential relates to the irrevocable fact that in every transaction between man and man there must be taken into account the point of view of each party to the transaction. And in some of the figuring that has been done by certain dentists, little account has been taken of the point of view of the patient.

It is imperative for every dentist who has any regard for his family or his other obligations in life, to study this matter of the business management of an office practice with some care, so that provision shall be made for those dependent on him, and also for himself in his old age. But to rigidly apply the "pound of flesh" policy to the practice of a profession is not in accord with the best traditions of professional procedure, nor will it tend to create respect or confidence on the part of the public. It has been the chief glory of the professions that they have from time immemorial ministered unto the poor and the needy, and heaven forbid that the day should ever come when they permit their ideas to so change that their activities are dominated solely on the basis of barter and trade. Just so soon as a professional man concentrates on the question of fees, and makes that the dominant note in his dealings with people, just that instant does he lower his profession-

al status and relegate himself to the ranks of commercialism. And there is no more deplorable spectacle than the commercialized professional man.

The point of view of the patient should always be considered in making fees, and no fee should ever be charged by a dentist that he would not willingly pay himself for the same service under the same conditions. It is true that dentists earn their money by the very hardest kind of work, and they are entitled to adequate remuneration. This is being more and more generally recognized, and people of means are usually willing to pay a good fee. But to make a cut-and-dried rule of a given amount per hour, and then hold patients rigidly to this schedule, is to work a serious hardship on some very excellent people, and to raise the suspicion that dentists are mercenary and are thinking only of the financial aspect of their occupation. Better far to be a poor business man and a good dentist than to be a good business man and a poor dentist; but best of all is to be a good business man and a good dentist. And there is nothing incompatible in the combination, provided a dentist studies both aspects of his occupation, and is willing to consider his patient's point of view as well as that of his own.

In all the relationships of life consideration for the other person's interests as well as one's own constitutes itself one of the chief factors in substantial success, and in a professional occupation this holds true more particularly than in any other calling. Let the dentist follow this plan in his dealing with his patients, and he will find that in the fulness of years he will reap a rich reward in pleasurable satisfaction, and in the end he will not suffer from it financially.

*C. H. Johnson*

---

HAEMOSTATICS.—As a haemostatic, turpentine, in my opinion, is superior to anything else in dental cases. I have had cases where Monsel's salt, adrenalin and other preparations failed. Put in a plug of cotton wool saturated with turpentine, and bleeding will cease, and, furthermore, the socket will heal in a clean manner, a characteristic not possessed by any other drug.—*Fred C. Deakins, Moree (Dental Science.)*

---

RUBBER DAM FOR USE IN FITTING PORCELAIN CROWNS.—Apply rubber dam to three teeth, one on each side of tooth to be crowned, but on the tooth to be crowned force silk well under gum; slightly under, labially, if preferred. Select tooth and grind to fit and finish. Result: Field of operation clean, perfect fit, no blood and no ragged gum to, perhaps, cause gingivitis.—*R. Dickson, Dubbo, N.S.W.*



# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada.

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, NOVEMBER, 1921

No. 11

## EDITORIAL

### The Legal Responsibility of the Dentist to His Patient

THE observant and thoughtful dental practitioner of recent years could not but be impressed with the increasing number of actual and threatened malpractice suits occurring within the ranks of the profession. These have, of late, assumed such serious proportions as to justify some consideration as to the cause and prevention.

One prevailing reason for this unwelcome state of affairs appears to be a lack of serious consideration on the part of the dentist as to his legal responsibilities, coupled with a growing knowledge on the part of the public as to the far-reaching effects of unskilful or careless dental services. Here, as in other departments of life, want of knowledge and care is the cause of much of humanity's troubles. He who persists in ignoring the general laws of hygiene is more likely to fall a victim to the prevailing epidemic. The pedestrian or motorist who is ignorant of the laws and customs of street traffic is the likely one to be injured or killed. So the dental practitioner who is ignorant or heedless of the grave responsibilities laid upon him, by reason of his calling, is most assuredly courting professional disaster.

The special Dental Act which confers upon the dentist the privilege of practising dentistry, also lays upon him very grave responsibilities. The dental practitioner, when he undertakes the treatment of any particular case, impliedly pledges himself that in the care of that patient he will exercise reasonable skill, care and judgment. On this point the law is very clear and very insistent. Carelessness, in particular, is



not tolerated at the hands of the dentist. The highest known skill is not always demanded by the law, and even an error in judgment may be sometimes excusable, but when the future comfort and health of our patients are placed in our keeping, *carelessness* is rightly looked upon, both legally and ethically, as a serious misdemeanor.

In all such cases when want of care is charged, the legal test is simply this: "What would an ordinary, skilful, careful and prudent practitioner have done under the circumstance?"—which, in short, means that care must be proportionate to the seriousness of the undertaking or situation. If the dentist is handling or administering deadly drugs, then nothing short of the utmost care will be considered sufficient. If he is operating in the oral cavity with some dangerous instrument, as rapidly revolving burs and disks, then the law demands that every precaution be taken to protect the patient from injury. If he is operating with some such instrument as the thumb broach, which is apt to be dropped from the fingers, then every precaution should be taken, by means of the rubber dam or mouth napkin, to prevent these articles from dropping into the region of the throat. And so in the case of extracting, all necessary precautions must be taken to prevent similar accidents.

Most assuredly, even under the most careful method of practice, the unexpected sometimes happens; but such cases are classified as accidents, and the element of negligence or carelessness is not considered as being present. And however serious the occurrence may be, if it be shown that the practitioner has taken all necessary and reasonable precautions under the circumstances, there cannot and should not be any successful claim for damages by the injured party. —R. G. M.

15, 16, 17, 18, 19th May, 1922

**P**LEASE remember these dates. It is the time of the 1922 Joint Convention of the Canadian and Ontario Dental Associations.

The convention will occupy the entire five days.

The place of meeting is Toronto, in the new King Edward Hotel.

The marked success of the conventions of the Ontario Dental Association is, of course, common knowledge to the dentists of Ontario. Both in point of numbers and in spirit the last convention quite eclipsed its predecessors. The Canadian Dental Association also has a most worthy history in its work of co-relating and furthering the interests of the dentists of the entire Dominion. Space does not permit an account of its many activities in this excellent work. A union of forces of these two organizations will without doubt produce the best dental convention ever held in Canada.

The new King Edward Hotel is now available, and ample accommodation has been secured for convention requirements. Those in attendance will appreciate the many advantages arranged for their convenience and comfort.

Entertainment of both dentists and their wives will receive especial attention. Particularly would the committee desire to make this a most enjoyable outing for the dentists' wives, and no pains to that end will be spared.

The program in course of preparation is unique and varied. Features of the more recent successful conventions will be incorporated, modified in the light of experience. Further announcements will appear both in the journals and in your personal mail, acquainting you from time to time with the progress of arrangements.

The Joint Committee desires your co-operation in making this the outstanding dental convention of 1922. To this end, Dr. E. A. Grant, 229 College Street, Toronto, Secretary of the Joint Committee, will be most happy to receive suggestions and to answer any inquiry. This is YOUR Convention.

### Japanese Dentist Subscribes to Oral Health "Forever"

**A**MONG our subscription orders for 1922 we have received the following communication from one of our good friends in Japan:

"Higashimuki, Vara, Japan, Sept. 20th., 1921.

Gentlemen:—

Will you please send me monthly hereafter your "Oral Health" forever? The price of which will be immediately sent on request.

Very truly yours, S. Morisawa, D.D.S."

### What Are You Getting Out of Life?

**W**HO gets the most out of life? The rich man? No, not at all. The poor man? No, not at all. The man who is in moderate circumstances? No, not at all. This particular test has no relation whatever to mere wealth, or the absence of it. It goes much deeper and reaches much higher. That man gets the most out of life who puts the most into it. For life is an affair of investment, and the thing invested is not dollars so much as personality; and that personality, to yield a good individual for the investment, must be employed in terms of service.

There are thousands of people who have no money—or very little—to spend in doing good; at least that is what they say. But the fact is that about everybody could find some money for that sort of an investment if he were to make a diligent search among his possessions. All right, if you have no money to invest in that way, why not make investment of other things that are more useful than money? There are chances for fine service everywhere. You must not be indifferent to them. Everyone must do what he can for the benefit of all. No man has the right to fold his arms and look on while others sweat with the toil of service.—Selected.

# Price Reduction

The genuine  
**Improved Dentinol Pyorrhea  
Scalers and Files**

Reduced in Price---Now  
\$1.00 each

## **Dentinol Perfect Syringe**

Complete with Platinum Iridium Point Reduced to  
\$2.50 each

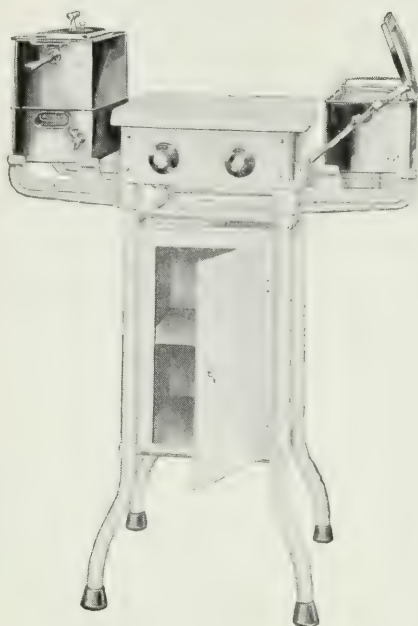
### **At all dental depots**

We aim to produce the best prophylactic instruments---based on correctness of design, accuracy of angles, quality of material, temper and finish.

Look for our mark, D & P CO. N. Y., to insure protection against inferior imitations.

**Note** *A copy of "Causes and Effects of Pyorrhea — Its Treatment and Prevention by the Dentinol and Pyorrhocide Method" mailed on request.*

**THE DENTINOL & PYORRHOCIDE CO., INC.**  
1480 Broadway - NEW YORK



## Castle Sterilizers

### Complete Satisfaction

The Satisfaction that is derived from using a Castle Sterilizer is not due alone to the fact that the sterilizer really sterilizes efficiently, but comes also from the fact the sterilizer exactly meets the requirements in the office.

There is a complete list of Castle Sterilizers—not just one model. You can select a sterilizer that just suits your needs.

*Illustration shows No. 1414 Electric. It consists of an Instrument and the Rochester Steam Sterilizer mounted on a special table. The Steam Sterilizer is the same as used by the Students at the Royal College of Dental Surgeons.*

Ask your depot for our new folder or write us direct

**WILMOT CASTLE COMPANY**  
1159 University Ave., Rochester, N.Y.

## Block Anesthesia and Allied Subjects

NOW READY.

Smith's book on "Block Anesthesia" has been eagerly awaited by the entire profession during the past few years. Every phase of the subject is covered in a masterly manner by one of the best known authorities on block anesthesia in the world. There are over 900 pages of text matter. The beautiful illustrations, over 595 in number, are an outstanding feature of the book. Price \$15.50.

**McAINSH & CO., LIMITED**

4 to 12 College Street

Canadian Headquarters

TORONTO

## DALHOUSIE UNIVERSITY

# FACULTY OF DENTISTRY

(MARITIME DENTAL COLLEGE)

HALIFAX

NOVA SCOTIA

1921-1922.

Lectures Begin September 21st.

The apartments of the Dental School are in the main University building. The Curriculum meets the requirements of the Dominion Dental Council. Dental students have full University privileges. For Calendar and information address

DR. FRANK WOODBURY, Dean,  
Faculty of Dentistry, Forrest Building, Halifax, N.S.

When Writing Advertisers Mention Oral Health.



# ORAL HEALTH CONTENTS

Vol. XI. TORONTO, DECEMBER, 1921

No. 12



Oral Infections and Their Treatment - - Page 433  
T. Sydney Smith, D.D.S., San Francisco, Cal.

Present Day Tendencies Towards Extraction " 444  
W. B. Amy, D.D.S., Toronto

Color as Applied to Dentistry - - - - " 447  
J. W. Beatty, R.C.A., Toronto

General Considerations on Orthodontics - " 453  
Dr. F. Huys

American Institute of Dental Teachers - - " 457

"The Sucker List" - - - - - " 458

Multum in Parvo - - - - - " 459

Dr. Clapp Awards Prizes - - - - - " 461

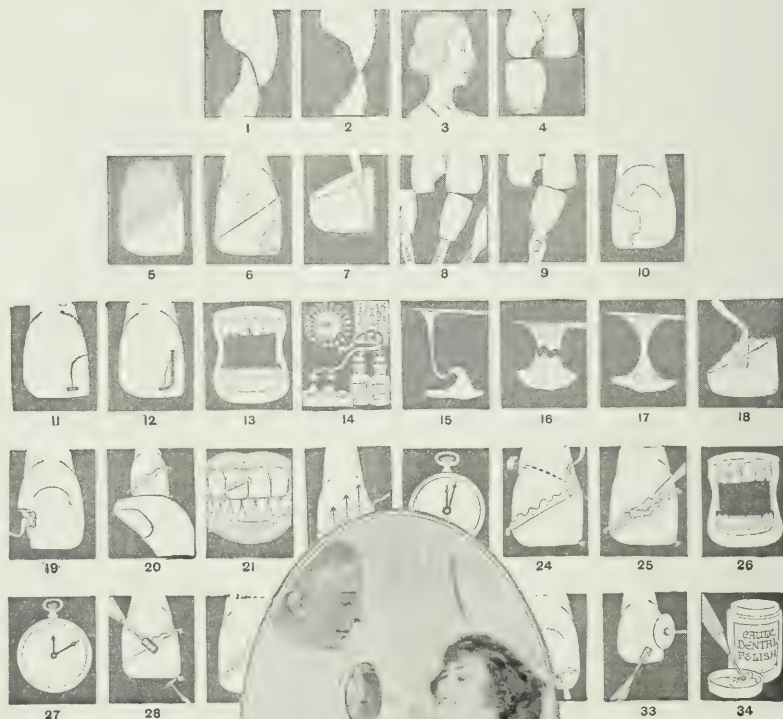
Dr. C. N. Johnson to the Dental Profession " 462  
—The Ebbing Year

Editorial - - - - - " 464  
—Christmas, 1921—New Year, 1922  
—National Dental Association Christmas Seals  
—Intelligence Tests in the Selection of College  
Students

Oral Health Index, Volume XI., 1921 - - " 467

*Give your patients the benefit. Write for booklet of 34 pictures showing simplified technique for permanent incisal-corner restorations.*

*Address: THE L. D. CAULK CO., MILFORD, DEL.*



DE TREY'S

## SYNTHETIC PORCELAIN

*The Chemical Porcelain*

distinguished from all ordinary silicate cements and enamels. **STRONGER** than any known cement, either dental or industrial

# ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF  
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 11

TORONTO, DECEMBER, 1921

No. 12

## Oral Focal Infections and Their Treatment\*

T. SYDNEY SMITH, D.D.S.  
*San Francisco, Cal.*

IT affords me a great deal of pleasure to be with you, not only because we are interested in the same scientific problems, but also because I am among my own people—I was born near Hamilton. I feel therefore that I am before a sympathetic audience, one that is sympathetic from every standpoint.

I regret that I must give you a talk instead of presenting a carefully written paper, but the invitation to address you came after I had started on my vacation, so I could not do otherwise. In giving a talk my remarks may be too disconnected, but I hope in the main they will be beneficial.

I shall, at the outset, lay considerable stress on the dangers which arise from small focal infections, but I want to be conservative in this presentation, as there is great danger of letting the pendulum swing too far one way, or too far the other. It would be a mistake to overestimate the importance of focal infections, but it would be a worse mistake to under-estimate them. I became aware of the danger of these focal infections before the role they play was generally recognized. That I may be clearly understood in this connection, I shall tell you briefly how I came to make the discovery.

When I commenced the practice of dentistry I was surprised to find how diseased the average patient's gums were, and I turned at once to our literature to see what the leading men were saying about these diseased conditions and what they were doing for them. I was impressed during this investigation by two outstanding facts. First, they said that the recession of the gums could not be prevented, and that pyorrheal pockets could not be cured. This was a frank admission of failure; they had nothing therefore to give me. In the second place,

\*Read before the meeting of The Canadian Dental Association, Ottawa, 1920.

the foolishness of the things they were doing for these lesions was beyond comprehension. They used surgical instruments to remove the calcs deposits from the roots, but they immediately introduced some acid into the wound to dissolve any particles of calculus the instruments had left on the cementum. This showed that they had no confidence in the thoroughness of their surgery. It is necessary to remove the last trace of calculus with the instruments, and in addition to this one must surgically freshen the surface of the cementum, which is extremely thin on the gingival third of the root, without exposing the dentine at any point. These men did not seem to appreciate that an acid which would remove the calculus would at the same time damage the root and destroy the liberated blood and many of the fixed cells. These tissues should be left in a condition which would permit them to take part in the healing.

After applying the acid, they next introduced some powerful germicide into the wound to kill the micro-organisms which their surgical instruments had failed to remove. Although the medical men were also using germicide agents to sterilize wounds at that time, it seemed incredible to me that bacteria, which must be boiled, or bathed in some medicinal agent which is as destructive to them as boiling, could be killed in the wounds by those agents without destroying much of the tissue.

Then, as though the acids and germicides had not wrought destruction enough, they deliberately poked pumice clear to the bottom of the wounds with orange wood sticks. I believe there is nothing in surgical history which equals the stupidity of this act, yet it was done by men who had been exposed to science while receiving their dental training.

I felt, therefore, that if I was to accomplish anything in the treatment of these lesions I must make a thorough study of the subject myself. I conducted this investigation by main strength and awkwardness, perhaps chiefly awkwardness, but arrived at the decision that it is biologically possible to cure a pyorrheal pocket. I had seen enough through the microscope to convince me, and nothing could shake that belief. I could see, however, that to attain this result one would have to operate with almost a microscopic degree of accuracy, and thought I might not be able to accomplish this, but made the attempt. At first I failed, and continued to fail for some time; but my faith was not shaken. At last in January, 1903, a deep chronic pocket which I had treated surgically, healed so rapidly and perfectly that there could be no doubt that a vital reattachment of the tissues had taken place. I could not repeat this result for some time, but eventually got a second rapid and perfect healing. The third one came more easily. From that time on the percentage of perfect healings increased as I improved my surgical technique.

You can see, then, that the successful treatment of pyorrheal lesions



was not an accidental discovery, as it was based on scientific principles, and was anticipated by me. But I afterwards discovered two very important things, and I wonder today that I had not also anticipated them. The first was, that when I did the necessary work to cure the pyorrheal pockets and gave sufficient prophylactic care to prevent their recurrence, the teeth were rendered almost immune to caries. In the second place, I found that patients who had been suffering from localized as well as general systemic diseases were either greatly improved or permanently cured when I eradicated all of the focal infections. When this result occurred in some scores of cases I felt it my duty to acquaint the members of the medical profession with the discovery.

I went to one of our leading medical educators and told him what I had observed. He listened until I began to enumerate the diseases which may be caused by these small focal infections. But when I included acute and chronic nephritis, he interrupted me and went into a long scientific explanation to show that such a thing was impossible. Today this same man is one of the strongest believers we have in the danger of focal infections, and he includes acute and chronic nephritis among the diseases which arise from these sources, just as I did in those days.

A case from my own practice will help us to see how the various organs and tissues may be affected by comparatively small septic spots. In April, 1914, a prominent medical specialist came to me for the treatment of his gums. At that time he was a strong man in his early forties. Two of his upper molars were so badly affected with pyorrheal conditions that I made no attempt to treat them, and, although they were vital teeth, I advised him to have them extracted. I also requested him to have a lower pulpless bicuspid radiographed. He intended to follow my advice, but as he was a busy man he neglected it. On the first of May, 1916, he was stricken with a very inflammatory type of arthritis which apparently affected every joint of his body. In addition to this, he had a severe attack of gastritis which caused such pressure on the diaphragm that it almost stopped the action of the heart. He was attended by the best medical men that could be secured, but they could find no cause for his serious condition. When I heard of his case, I sent them word that he had these septic teeth which should be extracted, as they might be the source of his trouble. About the first of June, they took me seriously and asked me to come and extract the affected teeth. They made this request of me because he was so weak they did not want a stranger to come near him. Although I had not extracted any teeth for years, I yielded to their request and went to his home. But the physicians, after holding a consultation, decided that he was too weak to stand the strain of the extractions; they thought the shock would kill him. He grew steadily worse, and developed double pleurisy and pericarditis.

About the end of June, his physicians again requested me to extract the teeth, saying that he did not have one chance in a million to recover unless this be done; it was their only hope. He was so weak he could neither swallow nor expel his saliva; a condition commonly known as the death rattle. On the third day after the teeth were extracted he began to improve, and gradually regained his former health. Today he is stronger than he had been for ten years preceding this illness. By these three extractions we saved the life of this useful man to continue his important work.

If time would permit, I could cite case after case where marvelous cures have been brought about by the complete eradication of oral septic foci. I believe, therefore, that we should attach great importance to them, but we must remember that any other septic spot will also endanger the health.

Septic foci may be divided into two clauses, primary, and secondary. A small septic spot at one point may cause a more serious infection in some other organ or tissue no matter how far apart they may be in the body. The latter would be a secondary focus. I believe that nearly all oral infections are primary foci.

Oral infections should also be divided into two groups; the apical, which result from the death of the pulp, and the periodontal, or those which commence in the gingival sulcus. It has been commonly believed and publicly stated that the apical infections are more dangerous to the body than pyorrheal lesions, because the former are under pressure, while the latter drain freely into the mouth. I believe this supposition is a mistake. Apical infections are dangerous; there has been much evidence to prove it. But pyorrheal lesions are more dangerous for several reasons. In apical infections the danger appears to arise chiefly from the presence of anaerobic strains of the streptococcus veridans. Pyorrheal pockets also contain these anaerobic strains of the streptococcus veridans in the bottom of the lesions, where the depth of the pockets, and the symbiotic influence of other organisms force them to live and develop in a low degree of oxygen tension. But these same pockets also contain aerobic strains at the top of the lesions, where the organisms live in a high oxygen tension. In addition to these, the central portions of the pockets contain strains which range all the way from these strict aerobes to the anaerobes. When these various strains of bacteria enter the blood stream, I believe that they must of necessity possess much more highly differentiated elective localization properties than the pure strain anaerobes which are to be found in apical infections. I am aware of the fact that some scientists do not believe in this theory regarding the elective localization of the organisms; however, there can be but little doubt that both the living organisms and their toxins enter the circulation from apical infections in spite of the more or less incapsulated character of the granulomatous areas. If this is the case, then the greater number of open blood ves-

sels which line the unhealed surfaces of pyorrheal pockets furnish the organisms with a far more abundant path of entry than is found in apical infections.

The very fact that pyorrheal pockets are open lesions draining into the mouth makes them more dangerous for the body than apical infections, because they constantly receive new strains of bacteria from outside sources, against which the tissues of the body are not immunized. These new strains must differ tremendously in the degree of their virulence, and I believe that this, in a measure, determines their pathogenic specificity.

In the fourth place, there is usually much more tissue involved in periodontal than in apical infections. This is especially the case when we include, as we should, the incipient gingival infections. I am becoming more and more convinced from the results of my work that these slight infections, where the gingivae are red, or have a tendency to bleed from ordinary brushing, are very dangerous to the general health.

If it is true, then, that chronic periodontal lesions are dangerous primary septic foci, and that correct prophylactic care will not only prevent their occurrence but also render the teeth almost immune to caries, it is surely the duty of every dentist to give the greatest attention to preventive measures. It is deplorable that so many dentists either neglect to give their patients' teeth the necessary prophylactic care, or employ girls who have little or no dental education to do this work for them, that they may spend their time patching up defects which should have been prevented. Many girls have the delicacy of touch and the endless patience which one requires for prophylactic work, if they had sufficient training. But why should they be permitted to do this, which is by far the most difficult and important branch, without having a full dental course, while they are debarred from other operations? There is absolutely no other branch of dentistry which requires a broader or more thorough dental education than prophylaxis, because every other operation is fundamentally based on it, and there is no operation where one is so liable to do irreparable damage. To be at all efficient, one must have both a theoretical and practical knowledge of general dentistry, then add to this his prophylactic training. If girls are to be legally qualified to perform this, the most important dental operation, with only a partial dental education, why should they not be permitted to perform all other dental operations with the same amount of training? The trouble is, dentists are making easy money by paying these girls a moderate wage, and charging the public big fees for their services. If we, who have been granted dental diplomas, are to degenerate into mere business men in this branch of dentistry, then why not do the same in all the branches?

Since preventive dentistry is so essential, we must be able to detect the slightest defect in the supporting structures of the teeth; we must



know perfectly normal gums when we see them. It is surprising how many dentists think that healthy gums are red. As a matter of fact, gums are never red unless they are irritated or diseased. It would not be quite enough to say that healthy gums are pink. One should add at least one adjective, and say they are light pink.

Another mistake which must be corrected, is the theory that the gums eventually recede as the result of a natural physiological process. The form of the gums is just as important as the form of the teeth. When normal they constitute a series of almost perfect inclined planes which not only permit the food to pass over from the direction of the crowns of the teeth without injuring them, but which actually require a friction from that direction to cleanse and stimulate them. But when the thin gingival margins of the gums are lost or become swollen, or when the septal points are shortened, they obstruct the passage of food and are bruised and injured instead of being benefited by it. It does not seem reasonable, then, that nature should give us such perfect tissues to meet so great a need during the early part of our life, and then deliberately remove them by a physiological process during middle life or even in old age, since they are needed then just as badly. Long experience in prophylactic work has convinced me that gums do not recede when cared for properly. But, on the contrary, I find that nature puts forth tremendous efforts to retain them, and makes the most of every bit of assistance we render. I have even seen the tissue re-cover denuded labial portions of roots, if the cementum was intact, when gentle surgical aid was given at intervals. This result was secured to a considerable degree for Mr. H., the patient whose mouth some of you examined during my clinic at the Panama Pacific Dental Congress, in 1915. When he came to me for treatment some years previously, the labial surface of the root of the upper right lateral incisor was denuded for a distance of at least seven millimeters above the enamel margin. When you saw him in 1915, there was less than three millimeters of the root denuded. And, as you will remember, the gum was firmly attached to the root and looked like normal tissues.



Fig. 1 is a photomicrograph of a plaster model of the teeth of a lady over ninety two years of age, showing the septal points of the gums still retained.



Fig. 1, which is a photograph of a plaster model of the teeth of a lady over ninety-two years of age, supports my contention by showing that the septal points were still retained. The significance of this will be more apparent when I state that she had been wearing a partial rubber denture, and had paid little or no attention to the cleaning of her teeth. One feels like asking how much longer we would wish the septal points to remain intact?

Few children's mouths receive sufficient care to give the teeth and their supporting structures a proper start. As a rule they eat such soft foods, and give the gums so little artificial stimulation that the gingivae remain red and swollen after the eruption of the teeth, instead of developing a thin tough margin which slightly overlaps the enamel. I was more than ever impressed with this fact just before leaving home. I wanted to find a plaster model of a young mouth with normal gums, and examined several hundred models, but did not find one with normal gums around all of the teeth. In many cases all of the gingival margins were swollen. Others showed that the septal points were hypertrophied.

When the gingivae are even slightly irritated and red they develop acids which soon produce carious spots on the crowns of the teeth. These acids are apparently of bacterial origin, because they disappear as soon as the gums are restored to health. Acids of this character quickly dissolve out the cement substance from between the enamel rods, giving the affected portion a white appearance. This is followed by the breaking down of the enamel rods, and the formation of a carious spot.

No matter how much the septal points are hypertrophied they should not be cut off. They very soon return to normal if the tooth surfaces underneath them are thoroughly cleaned and polished, and if this is followed by sufficient brushing to maintain cleanliness and stimulate the circulation. When this is done, the acid action immediately ceases. I have many patients of all ages who have not had one new cavity develop since their teeth have been given this sort of care. Some of these patients have gone more than fifteen years without any new cavities developing and I see no reason why they should not continue to have this experience. Are not such preventive measures worthy of receiving our chief attention?

Although it is possible to maintain the health and form of the supporting structures of the teeth throughout life, we are confronted with the fact that most of our patients have not had sufficient care given to their teeth to prevent periodontal diseases. It is important, therefore, that I should show you some photomicrographs of cementum, as they will help us to understand why the soft tissues which have been separated from the roots of the teeth by periodontal diseases can become vitally re-attached, when aided by proper surgery. These photomicrographs are all the more necessary at this time since some writers still maintain that a reunion of these tissues is impossible.

The men who state that the soft tissues cannot become reattached to the roots base their arguments on the old theory that cementum receives no nutriment from the pulp, and therefore dies and becomes a pus soaked sequestrum when separated from the pericementum by pyorrheal destruction. They claim that the reason why cementum does not receive nutriment from the pulp is because its first formed lamella is too compact to permit nutriment to pass through it. We shall see by these photomicrographs that nutriment does pass through this first lamella by osmosis, and that there is no scientific ground for the stand they take.

The first of this series of photomicrographs, which was taken from a longitudinal section of a young human tooth, shows the first lamella of cementum forming around the granular layer of the dentine. The cementum can be plainly seen in disconnected segments which show no tendency to form a dense impenetrable barrier to the passage of nutriment.

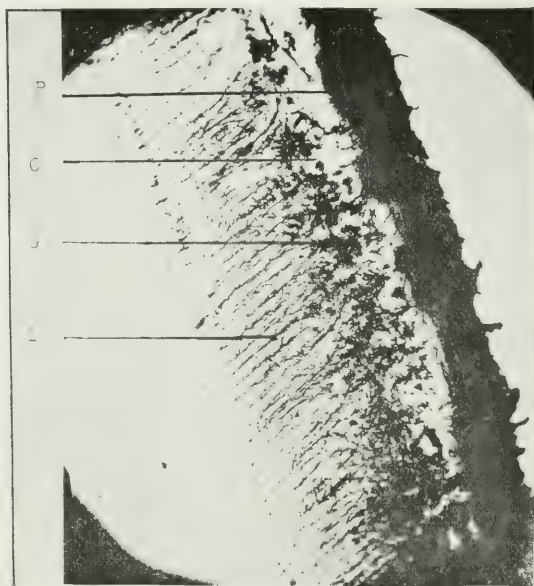


Fig. 2, which is the first of the series of photomicrographs, shows a longitudinal section of the developing root of a human tooth with the first lamella of cementum forming in disconnected segments around the granular layer of the dentine. P, the pericementum. C, the first lamella of cementum. G, the granular layer. D, the dentinal tubuli. These photomicrographs were prepared by Dr. John S. Engs, of Oakland, California.

The second one of these photomicrographs shows a longitudinal section of the root of a tooth extracted from the mouth of a patient sixty-five years of age. In this case there is absolutely nothing at the union of the cementum and dentine which can by any stretch of

imagination be interpreted as forming a barrier to the passage of nutriment, but, on the contrary, some canaliculi of the cemental lacunae are directly connected with the granular layer of the dentine, a thing which our leading histologists have claimed does not occur. The only portion which is at all compact in its structure is the outer or last formed lamella, through which, all will agree, nutriment must have passed from the pericementum to the central portions of the cementum.

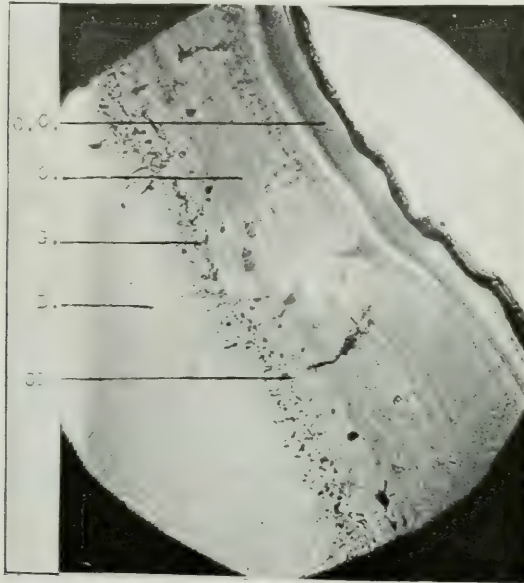


Fig. 3. Photomicrograph of a longitudinal section of the root of a cuspid tooth, extracted when the patient was sixty five years of age. In this case the first formed lamella of cementum is just as cancellous as the rest of the cementum, and in addition to this some canaliculi of the cemental lacunae are directly connected with the granular layer. These canaliculi are so irregular in form that the section, being cut in a single plane, makes some of them appear as disconnected dots, when in reality they were continuous passages in the root from which the section was cut. C.C., The outer compact lamella of cementum. C. The central portion of cementum. G. Granular layer of the dentine. D. The dentine. C.L. The canaliculi of a cementum lacuna.

The third photomicrograph shows a section in which the first formed lamella is much more compact than the rest of the cementum. But with the magnification used in this case, which shows the cancellous character of the rest of the cementum, it can be seen that this lamella is also cancellous; it is only relatively more compact than the rest of the cementum. In addition to this, large bundles of fibres pass directly through the first lamella.

It should be remembered, however, that nutriment passes into and through cementum by osmosis, and that neither the lacunae with their branching canaliculi nor large bundles of fibres are essential to its passage. To illustrate this point, I will show a photomicrograph of ce-



mentum which is made up of two distinct types. Some of the lamellae in this section contain many lacunae, while others show no trace of them. Yet all will agree that nutriment must have passed into and through the one portion just as freely as into and through the other.

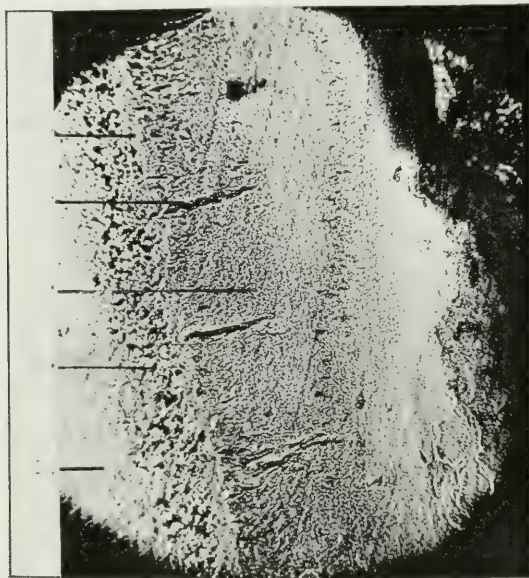


Fig. 4. Photomicrograph of a longitudinal section of the root of an adult human tooth, showing a case where the first formed lamella of cementum is more compact than the rest of the cementum. F.C., the first formed lamella of cementum. F, a large bundle of fibres. C, cementum. G, granular layer. D, dentine.

These photomicrographs furnish convincing proof that cementum has two sources of nutriment; it can be seen that it receives its supply from both the pericementum and the pulp. Therefore, if a portion of the cementum of a vital tooth becomes separated from the pericementum by pyorrheal conditions, it does not necessarily die, because the pulp continues to supply it with nutriment. And, if the involved cementum is living, it is biologically possible for the soft tissues to form a vital reattachment to it, when its surface is surgically freshened.

My own clinical work has convinced me that this theory is correct. In cases where I have operated correctly on the roots of vital teeth, the soft tissues have reunited rapidly, without any recession, and continued year after year to look as though they had never been separated. I have watched some of these cases for over sixteen years. May I ask how much longer we must wait before we can be sure that a reunion of the tissues has really taken place? On the other hand, I have not yet had a single case where the tissues have formed this sort of a reunion to the root of a pulpless tooth; they merely granulate and



tighten around it. Other surgeons who employ my technique are meeting with exactly these results. If the involved cementum of living as well as of pulpless teeth were dead, why do we find this difference in the healing?

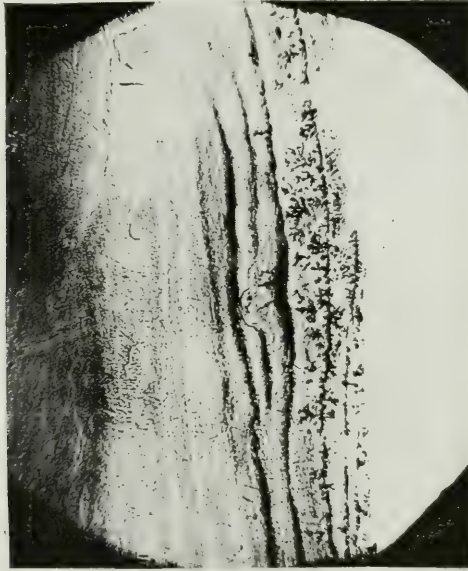


Fig. 5. Photomicrograph of a longitudinal section of human cementum, showing two distinct types.

If the men who oppose this theory regarding the cementum had a rational or successful treatment for pyorrheal lesions to offer, we should listen to them; but you all know they have not. They cut away the gums and bones from around the roots, leaving a condition which is usually worse than would result from extraction. Steps must be taken to protect the public against such practice.

---

### LITTLE SPECK.

---

*S* AID little speck, leave me alone  
 Oh, I'm too small to bother,  
 I'll hide behind a little tooth,  
 You'll get me out to-morrow.  
 "Oh, no, you won't," the wise boy said,  
 "You'd cause me lots of sorrow.  
 I'm going to use my tooth brush now,  
 You'll not be here to-morrow."

—Dora L. Cameron.

## Present Day Tendencies Towards Extraction

W. B. AMY, D.D.S., TORONTO.

**I**N all ages great reforms have been brought about by extremists. The present day is no exception to the rule. Dentistry has been, and is to some extent still, at the mercy of extremists. In pathology men are working overtime to prove or disprove that focal infections of the oral cavity are responsible for most of the ills and afflictions of the flesh. Crown and bridge specialists are introducing systems that would require a mechanical engineer to fathom, root canal enthusiasts have been busy for some time working out intricate techniques for the treatment, enlargement and filling of root canals until ordinary dentists look on this process as a bogie to be avoided. Denture faddists are adding new ideas every day to a maze of details that change over night, and last, but by no means least, the dental and medical world have gone mad in the clearing up of disease by extracting.

It is not so long ago that we as dentists thought we had advanced so far along the road to perfection that we attempted to restore to usefulness roots and teeth in all stages of decay and infection. With smug satisfaction we viewed our accomplishments and pronounced them good.

In 1908 Dr. Hunter, of England, startled the world of dentistry by his condemnation of crowns and bridges and the unsanitary condition of the mouths containing such work. A storm of protest arose from dentists all over the continent, but some of the saner men began some investigations of their own, and found just cause for worry. Dr. Rosenow, now of the Mayo Clinic, Rochester, Minnesota, threw a larger bomb into camp, which completely demolished the structure dentistry had so carefully and laboriously reared.

We have not yet recovered from the devastation produced, and when such men as Rosenow, Billings, Hartzell, Grieves, Vaughan, Gilmer, etc., agree, we have just reason to respect their findings and take seriously their assertions that many oral focal infections are the cause of such diseases as arthritis, myocarditis, iritis, neuritis, etc.

Let us carefully examine where this theory has placed dentistry.

Dentists have been, and are, questioning the advisability of saving teeth by devitalization, treating and filling root canals when the process seems so exacting, especially when some authorities maintain that there will still be infection at the root end or that it is liable to infection and will be a constant menace to the health of the patient. In the United States the 100 Per Cent. Club was formed

and is a fairly strong body to-day. They contend that all devitalized teeth—past, present and future—should be extracted. One prominent dentist in England has gone so far that he has had all the teeth of one of his children removed, in the hope that she would thus be able to avoid the diseases attributed to oral focal infection.

Physicians have become suspicious of crowns, bridges and devitalized teeth, and are by the wholesale sending their patients to the hospitals or to fellow practitioners who have X-Ray machines for dental radiograms. Interpretations are frequently made by the hospitals and physicians, and the teeth on these interpretations extracted.

Too many times the patient has received the impression that this procedure will cure her disease or diseases. Unfortunately the cure has not come to pass in many cases, and the patient is very prone to blame the dentist who did the extracting.

The slaughter still goes on, although there is a considerable attempt at the present time to stay the tide and establish again saner methods.

The question of the management of these cases must be approached with an open mind, as narrow principles in dealing with public health are dangerous. Dr. McGee has said in a recent article:

"The responsibility for the health of the public is divided between medicine and dentistry. No dentist is capable of handling disease apart from the mouth unless he is a medical graduate, and no physician is capable of handling oral diseases unless he is a dental graduate; but by the co-operation of these two professions the health of the community may be conserved."

Let us consider some of the conditions that will help us toward a more conservative and humane dentistry.

#### AIDS TO DIAGNOSIS:

##### 1. History—Family.

Individual.

##### 2. Thorough examination of the oral cavity by a dentist.

a. Testing for vitality.

b. Looking for pyorrhoea pockets.

c. Inflammatory conditions and their causes.

d. Indications in the mouth of diseases of the body.

e. Fistulous openings, etc., with a written report of such findings.

3. Secure the very best dental radiograms procurable at any price, with an oral examination by the dental radiographer, who, in my opinion, should, if possible, be a dentist of some years' experience

as a dentist. He, too, must give a written report of the radiograms and the oral conditions. If this report or record is returned to the dentist who referred the patient, that dentist can now intelligently arrive at a conclusion as to the correct procedure. If possible, also have a written medical report of the examination of the patient by her physician.

#### AIDS TO PROGNOSIS:

1. Age of patient.
2. Health.
3. Length of sickness.
4. The condition of the rest of the mouth.
5. The position of the tooth or teeth in the arch.
6. Extent of injury or infection.
7. The number of teeth involved.

#### *A Word to the Physicians.*

I take it that your most earnest endeavor is to give your patients the best service possible. If this is so, are you fulfilling your own desire by sending your patients to a hospital where there is no dental service, or to a physician (who is not a dental graduate) for dental radiograms, and in many cases getting not only an interpretation, but a diagnosis and prognosis settling the question of extraction, before a dentist has even seen the case? In other words, is it a square deal to your patient to arrive at a decision on what is, after all, a dental question, before a dentist has been consulted?

The study of the oral cavity has been left in our college curricula to the dentist. Then how can men without dental education give dental advice?

Who is it holds the post mortems on extracted teeth and "checks up" with his radiographic and other preconceived conclusions? Is it the physician or the dentist?

#### *A Word to Dentists.*

Are you as dentists fitting yourselves for the prominent place dentistry occupies in the conservation of public health? Are you keeping abreast of modern thought in dental matters, so that you can give physicians the information they seek from you for their patients?

Do you know a good dental radiogram when you see it, and are you capable of giving an intelligent interpretation of such radiogram? If the dental radiogram is not good, refuse to have anything to do with it until a good one is produced. Poor radiograms and misinterpretations have been responsible for many errors in extracting.



Can you make a thorough examination of the oral cavity and recognize conditions contained therein?

If you cannot do all of these things, and more, you must not expect physicians to come to you for advice. Each case is a law unto itself; there is no standard that can be set, nor any rule followed.

Knowledge, intelligence and saneness are three very essential necessities for the dentist who will help dentistry to-day.

The future should be marked by:

Standardization of root canal technique.

Standardization of crown and bridge work.

Standardization of denture work.

But, above all, we must intensively study every means for making Preventive Dentistry the outstanding feature of our future work.

---

## Color as Applied to Dentistry

---

J. W. BEATTY, R.C.A., TORONTO.

---

THAT there is such a thing as color blindness is a proven fact. It exists in varying degrees. There is what is known as total color blindness, and to the person who is totally color blind all objects appear in grades of black and white, as engravings, photographs, black and white monotypes. This form of color blindness is very rare. There is another type of color blindness in which those afflicted are blind only to one or two colors, and become puzzled in the distinction of red and green, which are the colors that are almost invariably found to be defective in ordinary cases. There are others who can detect only decided colors, neutral shades losing their distinction. Such eyes are best in the distinction of the most luminous colors. They are to sight as the ears of the hard of hearing are to sound.

Color blindness was first brought to public notice in 1774, when a well-known Quaker by the name of Dalton, a prominent chemist in England, attended a meeting of the Society of Friends arrayed in scarlet hose, for which offence he was nearly excommunicated, and made matters much worse when he denied the charge. He was red blind. When later he received from Oxford the investment of the scarlet gown he was able to appreciate the honor, but not the gown—it looked like the trees to him, and consequently he came very nearly giving his name to color blindness; but he did not quite

measure up to the standard required, as he was blind only in one color. To a man of that type of color blindness red would appear green, or neutral grey, and green would appear red.

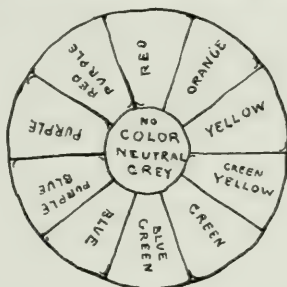
It was not for many years after that that the real serious nature of color blindness was brought to the attention of the railway authorities in this and other countries, when it suddenly dawned upon those people that many accidents, the cause of which could not be explained, might possibly be due to the inability of their employees to detect a green from a red light. As those are the two colors which are most important in the operation of railways at night, their suspicions as to the cause of these accidents were plainly well founded. The result was that they subjected all their employees to a color test in 1874. The man who was deputed to make the examination reported to the effect that about 40 per cent. of those that he examined were suffering from color blindness, giving a list of the different men. The officials were so astounded at the tremendous percentage that they insisted that the test be repeated. The same man went out and made a second test, and again handed in his list of those in whom he detected a defective color sense. The percentage was even greater than in the first place, but as the lists did not agree, the authorities subjected this man himself to a test and discovered that it was *he* who was color blind.

The percentage of color blind amounts to about five per cent. in the male gender, but to less than half of one per cent. in the female.

Realizing the existence of this defect in eyesight, it is well for us to take measures to guard against the dangers that we encounter in any profession where an acute color sense is necessary, and such undoubtedly is the case in dentistry, where we are called upon to match closely the most delicate tints and tones that are found in the human teeth. Color blindness should not disqualify a dental student, nor should it prevent a dentist from carrying on his profession successfully, provided he is aware of this defect, in which case he can take means to overcome the danger by the employment of an assistant, to whom he can at all times refer with regard to the detection of the color of the teeth of his patients. I would strongly advise all dentists to have their eyes examined in this respect by a thoroughly competent oculist.

In the study of color it is necessary that we should familiarize ourselves with the complementary colors, and to do this we should know the color chart. In a painter or artist this knowledge is necessary, that he may by the use of complementary colors, in close juxtaposition to each other, enhance the value of all colors; but in a dentist that knowledge is necessary, inasmuch as it will teach him certain things to avoid.

If we introduce a set of teeth into the face of a patient which are of the complementary color—or, in other words, the opposite of the complexion—the result will be that the teeth will no longer be a part of the face, but an outstanding spot of color in it. If we divide the color of the teeth into any three different classes of white—one we will say tinged with red, a pinkish white shade, a yellowish white



This chart gives us the complimentary colors: Red being the direct opposite or compliment of Blue green. Red purple that of green. Purple that of green yellow, etc. But Blue goes to Blue green, Green to green yellow, yellow, etc. In either way we obtain a harmony, one by strong contrasts, the other by what might be called the sliding scale.

and a bluish white—we include the three principal primary colors.

In a person of delicate pink complexion, if we were to use a greenish white tooth the result would be a decided contrast, and the teeth would be too obtrusive. We would use rather the pinkish white. In all cases such as the Asiatic, Chinese, or Japanese, with their yellowish complexion, the teeth partake of that particular hue, and would be found amongst the yellowish whites. In the case of the negro the same condition would prevail to an even greater extent. In the case of a mulatto, again we would have to refer to our yellows; but in each case the general character of the complexion of the patient would point at once to that particular color section in which we must search for the tooth that will fit that particular face and harmonize with the general color scheme.

It would be advisable at all times for a dentist to begin, with the entrance of his patient to the operating room, a close study of the complexion and general characteristics of the face, not only when the patient is in the chair, but preferably when at some distance from him. It is impossible to match color correctly at close range. The idea of standing within two or three feet of the patient and attempting to match the color of a tooth is a preposterous one, as no color can be seen in its true value and in its relation to its surroundings at a lesser distance than from five to six feet. In all cases it is a safe gauge to keep at least the length of oneself distant from the patient in attempting to closely match any tooth or filling.

In one instance that came to my notice, of a young lady who



had a porcelain filling put in a prominent tooth, I feel almost certain that the dentist who did the work must have been color blind, as the tooth itself was of a pinkish cast, while the filling was of a bluish or greenish cast. The tone or shade was well matched, but the color at a distance was very objectionable, and interfered greatly with her general appearance. The reason of this was hard to understand at first, as when at close range the filling appeared to be quite all right, but at a distance of six, eight or ten feet the difference in color was most noticeable. I feel sure that had the dentist taken the precaution to observe the color at a greater distance he would at once have detected his error. Your surest guide at all times will be from a close study of the complexion of your patient, and matching of color at longer range.

Another very important reason why a dentist should have an acute color sense is that he will be more readily able to detect diseases of the gums, which first become evident through certain discolorations.

We could go on indefinitely on this subject, and cite many cases where carelessness or defective color vision have led members of the profession into error, but it is not necessary to further dwell on it in this particular instance, as I feel that the warning that has been given will teach us the necessity for a closer study of color and its general bearing on the successful carrying out of the great responsibilities that a dentist must assume. That these responsibilities *are* great is made evident by the fact that the personal appearance, or the whole character of a person's face, can be changed—in fact, spoiled—by poor dentistry, and poor dentistry is more evident in color, as far as personal appearance goes, than in any other way. That the shape of the face can be altered by ill-fitting teeth is a well-known fact, but I doubt if an ill-fitting set of teeth would be as detrimental to the personal appearance of the patient as a set which are defective in color.

Another very important consideration, and one that has a great bearing on the ability or inability of any person to correctly detect color, is the surroundings in which it is seen, and for this reason we should be very careful in the choice of the light in our operating rooms, and of the scheme of decoration which we employ. The best light possible in which to see colors is a north light; the least desirable is a western exposure.

The effect of color on different individuals has been proven by a very extensive series of experiments carried out in several of the large institutions in the United States and Europe. It has been proven that the effect of different colors on the nerves are as follows:

Red is an irritant. If we can imagine a lunatic asylum decorated in red, and the consequent result on the patients, we can imagine a



very lively time. Red would increase and intensify the nervous condition of the patients until they would lose what little self-control they might happen to possess. If this is the case, as it has been proven to be, with a person who is mentally weak, it naturally follows that the same color will be irritating to any person, no matter how sound mentally, but of course in a lesser degree. The fact that red is irritating should be a warning for us to avoid anything approaching it in the decoration of a room for the use of people who are in a nervous condition caused by defective teeth, and the teeth probably give rise to more pronounced nervous conditions than any other of the minor ailments to which we are subject.

Orange is of the family of reds, and should be avoided, as should all positive colors, but particularly red and orange.

In the experiments of which I have spoken it has been proven that a patient who was in a very despondent condition, after spending a certain time in a room decorated with red, or in the color scheme of which red was the dominant note, was brought back from despondency to an almost hilarious condition, and in a short time became quite excited. On being removed to a room decorated in blue they reverted partially to their previous state, but on being placed in a room the decoration of which was a combination of tints of pink or mauve they gradually reverted to a normal condition. This can be taken as a proof of the desirability for tints of a neutral character in the decoration of our waiting rooms, and the less color used in the operating room the better. As a matter of fact, I think the most sanitary and the most appropriate scheme of decoration that I myself have observed (for an operating room) is that of white or ivory tints in a dull or mat surface.

The architectural lines, window hangings and furnishings in our waiting rooms should be kept as simple as possible, so that the patients waiting, in the nervous anticipation of the ordeal through which in their imagination they will shortly pass, will be left in peaceful, restful surroundings.

We are apt at times, after a hard day at business, to go home, pick up a book or newspaper. We are tired, nervously irritated, and our first thought is—turn down the light, subdue the light, it is hurting my eyes. We never think of putting out the sun at mid-day; we cannot get too much light at mid-day. We could not get too much light in our own homes, or any other surroundings, if they were of a restful, simple nature. It is not the light; it is the riot of color, of form, and of line around us, that is causing the irritation. If this be the case in a healthy person, a person in a normal condition of nerves, how much more so must it affect a person who is suffering from some nervous irritation such as that brought on by

defective teeth. This is, I feel, the strongest argument I can present in favor of a restful color scheme and simple architectural lines, both with regard to the design and furnishing of a room.

With regard to the light of a room, and the effect of various objects out of doors on the light, and consequently upon our ability to properly detect color, we must give very serious consideration. This was brought home to me by an incident in my own work, when I was compelled, through the frail health of a sitter, to paint a portrait in her own home. Outside the window, which was facing north, was a red brick wall, running at a right angle to the window. I painted the portrait, and until I got it into my own studio was fairly well satisfied with the result, but on bringing it into the studio I discovered that the whole color scheme had been affected by this brick wall, and where I had expected delicate pearl greys I found I had some very nice brick-colored pinks, which I had been entirely unable to detect while working on the picture.

Another thing that has a tremendous influence on the light of a room is trees growing near the window. With the sun shining on those trees we get a yellowish green note; with the trees in shadow we are apt to feel a purply green note through everything. This, we might contend, would affect the teeth in the head of a patient to an equal extent, with the sample teeth we are accustomed to use in matching shades; but this is not the case. The surface of the natural tooth and the surface of an artificial tooth are quite different, and this, in addition to the fact that the artificial tooth is seen at varying angles and the natural teeth at practically only one, is very apt to lead us astray.

The question of light in our operating rooms should be very carefully considered. If the most desirable light is impossible to obtain, we should take measures to guard against the dangers consequent upon those conditions which I have spoken of, and be more careful in the matching of color, even to the extent of the use of artificial light, which is, I consider, preferable to defective daylight.

The most desirable scheme of color, as I have said, for a waiting room or operating room is that of neutral tints, in which there is no pronounced color discernible; but a compromise may always be arrived at in the case of a person who is desirous of getting away from what are commonly termed "dead" or uninteresting color schemes. A very short time ago a dentist wanted some hangings made for a window, and consulted a young lady designer in the matter. His preference was for orange and purple, as it would warm the otherwise cold light of a window with a northern exposure. A compromise was arrived at by means of a purply grey and deep ivory tint, which gave him the note of color he wanted, but eliminated its

positive character. At all times we may be able to bring about a modification of the most extreme ideas of color schemes in decoration, but an expert in color should always be consulted in such cases, and the choice never left to the untrained eye and hand of an ordinary house decorator.

Too much stress cannot be laid on this point; too much thought cannot be devoted to the decoration of our rooms, or the choice of the light in which we work. We could go on indefinitely with suggestions of one kind and another, but I feel that by these warnings I have given you you will be brought more closely to a realization of the necessity for careful thought in the choice of your surroundings, both as regards their effect on yourself in your daily labors, and on the patient who is forced to consult you and who looks to you for relief from his suffering.

---

## General Considerations on Orthodontics

---

BY DR. F. HUYS.

---

**ETIOLOGY.**—To obtain a permanent correction it is not only necessary to make the arches normal and put them in normal relation to the face, but we must also make normal the different agents which influence the position of the teeth. Also the cause of the irregularity must be removed, or it will be necessary to mechanically retain the case as long as the cause is operative.

General causes do not come in the domain of orthodontics; they only cause irregularities by influencing the development of the parts in relation to the mouth and teeth, so in a way they become local causes.

Not only the cause as such has to be considered, but also the method of formation of the abnormality which results therefrom, in order to be able to treat at one and the same time, not only the cause of the abnormality but, in addition, the abnormality of the different agents which help to maintain equilibrium. Etiology will point out the possibilities and methods of treatment.

**GENERAL CAUSES.**—*Eruptive fevers and syphilis.*—These diseases affect the epithelial tissues causing atrophy of the enamel and occasionally death of the germ, which becomes a local cause on account of the missing teeth.

*Tuberculosis.*—During the period of anti-tubercular reaction the dental germs undergo exaggerated metabolism. The temporary and permanent teeth appear early, the latter before the absorption of



the roots of the milk teeth has begun, or whilst it is incomplete. There is early eruption of the teeth, and this is a local cause of malocclusion.

*Rickets.*—Its influence determines the production of spongy bone, whence arise the wide gingival borders, especially palatally. The temporary teeth appear late and are lost early. The permanent ones appear very late and after their predecessors have disappeared, and this is a cause of malposition. On account of the defective ossification the teeth are easily moved by abnormal causes. Correction is easy, but the tendency to relapse exists for a long time, and the necessity to obtain balance between the various factors is important.

In connection with rickets there occur all those factors during the formation of the organism which may hamper general nutrition, especially bone calcification, also defective feeding (lack of vitamins), constitutional and hereditary debility and athyroidism. All these factors favor mal-eruption and influence the stability of treatment.

*Pituitary hypertrophy.*—This shows itself by an exaggerated development of the osseous system, but especially and often only as regards the mandible. The horizontal part of the latter is lengthened, and this is due to deformity of the angle, as can be seen by examination. The angle is very obtuse, and the horizontal part therefore has more height and is advanced in relation to the face and prevents development of the maxilla.

The base of the tongue is brought forward, and the latter, instead of contributing to the development of the upper jaw, tends to restrain it. This latter deformity thus becomes a local cause of irregularity.

**LOCAL CAUSES.**—*Nasal causes.*—In addition to more or less complete obstruction of the nasal passages there is a temporary obstruction due to simple nasal catarrh. If this occurs frequently the naso-pharynx may be completely obstructed and cause mouth breathing.

In early childhood the tendency to contract the habit of mouth breathing is very great; in some a cold lasting a few days may see it permanently established without the slightest obstruction in the nasal passages. The consequences of this are well known and must be prevented. Mouth breathing is noticed at first during sleep only, and then one must decide if there is an obstruction or if a bad habit has been formed; this is determined by raising the jaw during sleep. The mouth having been closed, the child is disturbed and wakes up if the nasal passages are obstructed; if they are free, the patient continues to sleep peacefully. But in this case the mandible falls back and mouth breathing begins again when the hand is



withdrawn. To correct it the child should wear at night time an elastic band to hold up the mandible, and this sometimes gives a permanent result in a few weeks, but in any case it must be continued until nasal breathing is permanently restored.

From the orthodontic point of view, the mouth being open the muscles of the cheeks constantly press on the jaws. At each respiration the child stretches these muscles and especially those of the upper lip and the alæ of the nose, inspiration being less easy through the mouth, especially at night, when the tongue falls back against the palate. This difficulty of respiration results in aspiration of the naso-pharynx and the nasal fossæ, so that the external atmospheric pressure is not the same as that in these cavities. The result is lateral compression of the maxilla, the anterior part of which is thrust forward and the centre of the palate is raised, deflecting the nasal septum, which also contributes to the nasal obstruction. The upper molars are lingual to the lowers, and these are often inclined lingually. The very fact of keeping the mouth open causes the internal and external pterygoids to lose their tone, and they are no longer balanced by the muscles of the floor of the mouth. The horizontal part of the mandible is submitted to pressure downwards and backwards; the angle of the mandible becomes more acute, whilst the lowering is reflected in the conformation of the chest. The upper lip, constantly raised and having lost its natural function, is shortened. The lower lip is congested by constant tension of its muscles; its mucous and submucous tissues become flabby and swollen, and turn outwards. The commissures are stretched to reach back to the canines and, pressing on those, hinder the lateral development of the arches; this again favors the forward movement of the upper incisors and causes mal-eruption of the lower ones.

Treatment is not only to be directed to a restoration of nasal breathing, but muscle exercises and the correction of the dental irregularities are essential to improve the conformation of the face. The abnormalities from this cause are the more marked in proportion to the extent of the nasal obstruction and the youth of the patient.

*Buccal causes.*—Hare lip often causes projection of the upper incisor teeth as a whole, with displacement of the canines. Treatment should be to move the teeth back in a block so as to change the form of the bone by moving the apices.

In cleft palate cases the lack of bone formation is beyond our treatment, but if surgical treatment is indicated we should prepare for it as far as possible by bringing together the two parts of the palate by lingual movement of the molars and premolars. After perfect consolidation the reverse movement is undertaken very

slowly to widen the palate. All buccal movement is contra-indicated in cases that have not been operated on.

*Muscular causes.*—Muscles do not function correctly unless their points of insertion are normal and unless they undergo regular exercise. Lack of exercise leads to atrophy and an excess of hypertrophy. If the points of insertion are too close, the muscle fibres lose some of their elasticity and resist elongation. If the points of insertion are separated too much the muscles lose their tone. Any modification in one muscle group leads to modification in the opposing group.

So in cases of bone malformation of the jaws or mal-position of the mandible, the muscle insertions not being normal, the muscles are modified anatomically. On the other hand, if the muscles are modified by want of or by excess of exercise, the equilibrium of the opposing groups is broken and the position of the mandible will be influenced.

*Lack of use of Masticatory Muscles.*—There is no doubt that the artificial feeding of infants up to nine months removes a great stimulus for development of the mouth, as it requires so little effort on the part of the child. The circulation is not stimulated, and so the tooth germs must suffer from this. More serious still as regards development of the mouth is the bad nutrition which follows this period, especially if caries supervenes, causing partial or total lack of mastication. One will often be astonished if the masseter muscle is examined to notice how thin and weak it is.

This want of mastication not only causes flabby cheeks, exaggerated elevation of the molars and sometimes open bite, but the platysma being relaxed for the same reason, causes a poor, weak chest and round shoulders. Other causes may bring about the same phenomena, but Rogers has proved that the abnormal insertion of the platysma, as a result of the depression of the mandible, leads to these consequences.

Muscle exercise consists of stretching the masticatory muscles with intervals of rest. Every muscle exercise must be performed regularly, and the number of exercises must always be the same. In addition to these muscles, the platysma must be exercised in its normal condition, and to do this the patient should stiffen the whole body, raise the mandible and extend the neck.

*Hypertrophy of the Masticatory Muscles.*—As a result of caries or early eruption of the third molar, this hypertrophy is often unilateral; in such cases mouth hygiene and bilateral mastication are the remedies.

Too great tension of the muscles of mastication deforms the posterior part of the cheeks and shortens the naso-mental distance by too low an articulation of the teeth. This deformity arises at the expense

of the muscles of the floor of the mouth, and it is to these that we must look to obtain correction. The exercise consists in applying the mandible to the chest and forcibly opening the mouth.

*Pterygoid Muscles.*—These are influenced by the distal or medial position of the lower arch in relation to the upper. For the distal position the exercise is to thrust the mandible forward and it is so efficacious that Rogers has called these muscles "natural inter-maxillary traction." In the medial position of the mandible, lateral exercises may assist treatment.

*Muscles of the Lips.*—These are the principal factors in maintaining the dental arches in normal relation to the face. Lack of development therefore demands in the first instance restoration of their normal position and tone which is brought about by exercising the lips.—*Annales Belges de Stomatologie, and Dental Record.*

---

### American Institute of Dental Teachers

---

THE Twenty-Ninth Annual Meeting of the American Institute of Dental Teachers will be held at the Windsor Hotel, Monteval, Quebec, on January 23, 24, 25, 1922.

An interesting program has been arranged built around the theme of Preventive Dentistry and its correlated subjects: What, When, How and Why to teach. There will also be a complete exhibit of scientific teaching apparatus, college equipment, etc.

All interested in dental teaching are cordially invited to attend.

GUY S. MILLBERRY, *President.*

ABRAM HOFFMAN, *Secretary-Treasurer.*

381 Linwood Ave.,  
Buffalo, N.Y.

---

EPULIS AND GRANULOMA.—There would appear to be much more reasonable objection to the term "epulis" than to that of "granuloma." The latter does give an indication of the structure of the growth, but the word "epulis" simply means "upon the gum," and embodies no definition of structure whatever. Moreover, as pointed out by Heath, epulis is not a disease of the gums, "for these growths, although closely connected with the gums, do not originate in them, but in connection with the alveolar process of the jaws." They are connective tissue growths, and, according to this author, "are essentially sarcomatous in nature. In many cases the fibrous element so markedly predominates over the cellular element that they are frequently regarded as fibromata."—*J. H. Mummery, L.D.S., M.R.C.S., British Dental Journal.*



## “The Sucker List”

---

THE discovery of wholesale confidence gangs who do business from mahogany paneled offices, and who operate on the basis of “sucker lists,” does not justify the too ready conclusion that there is a fool born every minute; it may rather be a damning indictment of a failure to provide the people with proper information regarding the traps that are set for them.

The gambler who goes into “blue sky” operations either on the buy or the sell side, deserves all that befalls him, if he is speculating; if he is exploiting, he deserves the severest penalty the law can inflict. But the usual victim of these fake “get rich quick” schemes is not a gambler in the ordinary sense; he or she is usually an innocent person who imagines that “business men” have discovered a magic process of getting money out of the air. And they are encouraged in their delusion by newspaper advertisements, alluring booklets carried in the mails, and other devices to allay the natural suspicions of the mind untrained in business.

We go to great trouble to educate people as to the habits of the subtle tuberculosis bacillus. We induct people into a knowledge of the processes by which pneumonia takes hold on the human organism and saps its vitality. We instruct people in the philosophy and method of “safety first.” At election time the newspapers go to enormous pains to advise the people how to vote. But when it is a mere matter of a man investing his life’s earnings, he is left to the mercy of anyone who can get his ear.

Common sense should function in behalf of the uninitiated, and it would function if given a chance, or even half a chance, but the periodical literature of our times has been devoted so completely to the spinning of fairy tales about quick and magical wealth, that the people have become inoculated with the wrong ideas. They are victims of an illusory atmosphere which romantic writers have thrown around quite practical things.

There is a field for the giving of “safety first” in instructions to the people with regard to their financial affairs, if we are to judge by recent revelations. There are too many people who provide “easy picking” for men who should be breaking stones on the State roads.—*The Guardian*.

---

TRUING CARBORUNDUM STONES.—By putting the stones on a running mandrel either in an electric engine or a foot engine and placing them against the face of the stone on the laboratory lathe, both stones running at nearly the same speed and in the same direction, the stones will be trued up in one or two minutes’ time.—*F. H. Duncan, D.D.S., Chicago (Dental Cosmos)*.



# MULTUM IN PARVO

This Department is Edited by  
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

**TO STOP NAUSEA.**—If you would swab the back of the tongue with campho-phenique or spray the palate with chloretone, before taking a plaster impression you would relieve the patient of most of the nausea sensation.—*C. A. Kennedy.*

**A WAY TO KEEP OIL OF CAJEPUT.**—Many practitioners use oil of cajeput or some other for smoothing off the wax model for an inlay before removing from the cavity. To prevent using an excess and spilling the contents of the bottle, take an ordinary medicine bottle, fill with absorbent cotton, pour oil on this cotton until slightly saturated. When the pellet of cotton held in the cotton carrier is immersed into the oily cotton of the bottle it will not become over-saturated.—*F. S. Dilger, Dental Summary.*

**CARE OF HANDS IN LABORATORY.**—Before opening vulcanizer, or working in plaster or with flasks, if you will wash hands in soft water with good soap, and while still moist, pour on and rub in olive oil, you will find when you are ready to cleanse the hands that the stains have not penetrated the skin.—*J. C. H., Dental Summary.*

**INLAYS.**—If an inlay will not quite go into place, coat surface with a little carborundum powder and vaseline, and strike with mallet till a perfect joint is formed.—*C. Charlton, Dental Science.*

**AFTER EXTRACTING.**—After a difficult operation patients sometimes develop an osteitis or periostitis caused by mechanical injury to the bones. The symptoms are plain and marked tenderness to touch if the periosteum is involved, attended by more or less swelling. The treatment consists of dry heat or a wet dressing to the face, or the external application of a five to ten per cent. ichthyol ointment, together with the administration of aspirin or phenacetin in doses of five grains each, to be repeated every three hours until relieved.—*R. L. Hart, Penn., Dental Summary.*

NEW RUBBER TUBING.—I have found that in placing new rubber hose or tubing on Bunsen or gas nipple, owing to the stiffness of the rubber, it is very difficult sometimes to slip it over the end. A little oil dropped on the nipple or whatever it may be, will overcome this difficulty and you will be surprised how easily the tubing slips on.—*P. J. Lewis, Lockland, O.*

REMARKS ON X-RAYS.—Dr. C. N. Johnson's remarks on X-Rays are well worth repeating. "The X-Ray, although a great aid, is also a great menace. Never has a greater boon been given to dentistry than this, and never has a worthy method been put to more ignoble uses. It showed us the limitations of our pulp canal work; it exposed the discrepancies between what we should do and what we did do. It showed us the impossibility of doing some of the things we tried to do, and altogether it gave us a greater insight, and a better perspective of the results of our technical procedure. It awakened in us a new conscience, and stimulated us to do better work. We are indeed indebted in an immeasurable degree in these various respects. It also showed us the ravages of absorption in the bone around root ends, and furnished the means of investigating conditions which previously had been a sealed book. But it has misled us in some respects, viz., because of faulty interpretation, and because of its limitations as a discloser around root ends. Immediately, and quite naturally, the Medical and Dental professions jumped to the conclusion that any shadow in a radiograph at the apex of the tooth meant an abscess or an infection. Some of them undoubtedly did, but there are many of these cases in which it was quite impossible to say whether a shadow meant an abscess or whether it was simply a thinning of the bone from some absorptive process that may have occurred years previously, and around which to-day there was positively no infection whatever. The radiograph shows merely different degrees of density; it does not show pus, or demonstrate infection, and the sooner this is recognized, the better it will be for our patients."—*Dental Science Journal.*

STARTING COHESIVE GOLD FILLINGS.—In hypersensitive dentine, when excavation is almost intolerable, make the cavity only retentive in form. Place a large pellet of soft foil in the cervical region, drive cohesive foil into its centre, and the desired start is easily made. Soft foil thus used becomes a very powerful assistant.

TO KEEP FLASK BOLTS CLEAN AND EASY TO BOLT UP.—Leave them in a shallow bowl, containing a 10-15 per cent. solution of carbonate of soda when not in use. A piece of zinc in the vulcanizer pot will also keep the flasks and pot clean.—*C. Bernard Kay, Tanunda, South Australia.*

**EASY REMOVAL OF WAX INLAY MODEL FROM CAVITY.**—Paint cavity margins and teeth with very fine oil (Winchester Utility Oil), then blow away excess with chip blower. The wax form never sticks, and draws easily.—*Percy B. Cohen, Dental Science.*

**UNITING NEW FOIL TO AN OLD FILLING.**—Sometimes it becomes desirable to add to an old but good foil filling. Place the tooth under the rubber dam and dry in the usual manner; then clean it with ether, and cut the surface to which you expect to add foil with a sharp, clean dentate bur. Carefully anneal one or two layers of No. 4 foil, and work this into the freshly cut surface with a small sharp plugger point. Add the next layer with a larger point, and then proceed in the usual manner.—*F. W. F., Pacific Dental Gazette.*

**CASTING A RICHMOND, USING STEELE'S FACING.**—Grind facing and backing to fit root-end in front, sloping up to form a clearance of a thirty-second of an inch in the back. The pin should be about one-sixteenth of an inch longer than canal, serrated on and bevelled from facing on projecting end. Oil end of root, mould inlay wax over same and melt to end of pin. Melt an appropriate amount of inlay wax to backing, oil gingival end of facing and heat same enough to soften inlay wax on root when both are forced to place. The wax on root may be softened with spatula immediately before forcing facing and backing to adjustment. Unite two portions of wax with hot spatula, chill, remove and carve wax; remove facing, invest and cast.—*Joseph Homer, D.D.S., Dental Summary.*

---

### Dr. Clapp Awards Prizes

---

**D**R. GEORGE WOOD CLAPP, Editor of The Dental Digest, while in attendance at the last convention of the Ontario Dental Society, offered to give cash prizes aggregating \$100.00 for the best answers to the following two questions:

1. What did one hour of chair service to a patient cost me in 1920, exclusive of cost of material?
2. How do I know?

Two men sent answers to these questions, Dr. C. B. Taylor, of St. Thomas, winning the first prize of \$50.00, and Dr. A. E. Benson, of Essex, winning the second prize of \$25.00.

There was then remaining in the prize fund a balance of \$25.00, and Dr. Clapp generously donated this amount to the Canadian Dental Research Foundation. Dr. Clapp's deep interest in Canadian dental affairs is greatly appreciated by the profession.



## The Ebbing Year

THERE is something delightful, after all, in the rounding out of the passing years. Too often we permit ourselves to sing dirges when the shortened days of winter come. Too often we forget the significance of the season, and fail to count the real blessings which each variation in the climate brings to us. The autumn and winter are the resting seasons of the soil. In every clime where the temperature is the same the year round there is something lacking in the soil to make virility of man or beast. Change is the order of the universe, and blessed are those who live in a variable climate. It makes for stamina, endurance, and the will to do. The Vikings of old never would have flourished near the Equator, and the greatest men the world has known have been born in a rugged zone.

And so, when the leaves fall and nature goes to sleep at the end of the year, it is only the segment of a cycle—a cycle very interesting to observe if one but wishes to study it. The law of life is to work and rest—to rest and work, and nature shows us how this should be done in the most systematic and orderly manner. In this lull of activity nature is merely storing up energy to burst out in a glorious riot of color and form in the approaching spring and summer.

Never was there a more wondrous example of pure rhythm than in the coming and going of the seasons, and as the end of the year draws nigh we are but consummating one more period in the allotted span of our lives. It is a time for taking stock, for making new resolves, and for a higher consecration to the bigger and better things of life. It is a reflective time, one in which the retrospective enters in and tempers many of the asperities of the past twelve months.

It is also a time of the purest sentiment, when the blessed spirit of the Yuletide mellows the hearts of men and brings them into close communion with the softer graces of our existence—when we become



children again in spirit, and enter into that glorious realm of the dead, old patron saint of our common humanity—when Santa Claus is so real, when heaven is so near, and when the hearthstone is the blessed shrine where the family circle mingle in a communion of love and light.

The ebbing year renews old ties, recalls the sacred memories of the past, and inspires fresh hope for the future. It merges the whitened locks of age with the curly tresses of childhood, and bridges over the span of years between the two. It brings to the beating hearts of mothers the clasp of their best beloved, scattered far and near by the exigencies of life, and brought to the familiar fireside by the mistletoe and holly.

What a wondrous world it is at this time; what a wealth of affection wells up in the human heart; what a miracle of love and laughter, of hope and joy, of faith and freedom. How far we are from the sordid things of life, how near to the blessed sentiments of "peace on earth, good-will to men."

And as the years pass one by one let us learn the lesson of loving kindness, of charity, of forgiveness, of fortitude, of good cheer, and that higher and rarer virtue—unselfishness. Then shall we ascend the heights, and look broadly over the wider expanses of our common existence; then shall we enter serenely into that sublime and subtle realm where hearts are gold, and the drosser dregs of human life are winnowed out.

We may have greater happiness if we have the will; let us have the will.

*C. H. Johnson*

---

USE FOR MANDREL SCREWS.—When the threads of the screws belonging to the mandrel are worn out, use them for carrying stones by smearing a little sealing wax over the screw, and, with a good screwdriver, force the screw in while the wax is hot.—*P. Chater Charlton, D.M.D., L.D.S., Dental Science Journal of Australia.*

# ORAL HEALTH

## EDITOR:

WALLACE SECCOMBE, D.D.S., Toronto, Ont.

## CONTRIBUTING EDITORS:

C. N. JOHNSON, M.A., D.D.S., Chicago.

RICHARD G. McLAUGHLIN, D.D.S., Toronto.

MAJOR W. E. CUMMER, Toronto.

J. WRIGHT BEACH, D.D.S., Buffalo, N.Y.

BURTON LEE THORPE, D.D.S., M.D., Pasadena, Cal.

Entered as Second-class Matter at the Post Office, Toronto.

Subscription Price: two dollars per annum; Single Copies, 25c.

Original Communications, Book Reviews, Exchanges, Society Reports, Personal Items, and other Correspondence should be addressed to the Editor, Oral Health, 102 Wells Hill Ave., Toronto, Canada.

Subscriptions and all business Communications should be addressed to The Publishers, Oral Health, Royal Bank Building, 269 College St., Toronto, Canada.

Vol. XI.

TORONTO, DECEMBER, 1921

No. 12

## EDITORIAL

### Christmas, 1921—New Year, 1922

AS we quietly drift from the old year into the new two thoughts are uppermost in our mind. We are sincerely thankful for the Christmas spirit and for all that Christianity means to this old world, and we wonder whether we will, during the coming year, be more worthy of the trust reposed in us than during the year that is gone!

Every man has his place to fill. Every wheel and pinion in life's machine is essential. It is only as each individual plays his part that the whole machine functions harmoniously and efficiently. The part we play is unimportant; the essential thing is that we realize the dignity of labor and carry on our work to the very best of our ability.

Let us unreservedly give ourselves up to the spirit of Christmas, forgetting ourselves in the remembrance of others less fortunate. And withal let us imbibe the true spirit of this wonderful Christmas season, to the end that our greatest joy throughout the new year may be found in opportunities for rendering greater service.

*It is in this spirit that ORAL HEALTH wishes all its readers a very MERRY CHRISTMAS and BRIGHT AND HAPPY NEW YEAR.*

## National Dental Association Christmas Seals

---

THE National Dental Association in 1913 started a fund which to-day has grown to \$65,000, for the purpose of creating an endowment of \$100,000, the interest upon same to be used from time to time to give assistance to members of the dental profession who have rendered good service to dentistry, but who, in ill-health, old age or adversity, find themselves in dire need.

The money has been raised by means of Christmas seals, one hundred being sent to each dentist, with a request that he return, as a Christmas offering, at least one dollar for the Relief Fund.

None of the money has as yet been dispersed, but it is hoped that the fund will reach its objective this year, so that relief may be given to many needy cases. In future years the money derived from Christmas stamps, in addition to the interest on the endowment, will be available annually for relief work.

Should any of these N.D.A. Christmas stamps find their way into the hands of Canadian dentists, let us take advantage of the opportunity to show our friends to the south that we are good neighbors and sincerely interested in their very worthy enterprise.

Here's hoping the \$100,000 objective may be reached this year!

---

## Intelligence Tests in the Selection of College Students

---

THE following letter has been forwarded to the Editor by Dr. Frank T. Breene, Dean of the College of Dentistry, University of Iowa, who has been greatly interested in the application of mental tests to applicants to Dental Colleges.

Dr. Breene has, during the after-war period, when more students applied for enrolment than could be accommodated, applied similar tests at Iowa, and believes the time may come when all students will receive a test examination before being admitted to a course of higher learning.

*Kansas State Agricultural College,  
Manhattan, Kansas.*

October 10, 1921.

*To the Deans and Heads of Departments:*

*A problem which Colleges and Universities must meet in the near future is "a more rigid policy of selecting and retaining students." I thought you might be interested in the following results of the intelligence tests that we have been giving in this College dur-*

ing the last three years. Probably the most effective device for solving the above problem will be carefully worked out and scientifically applied intelligence tests.

(1) We have found that the predictive value (predicting success in College work) of one-half hour of mental testing is equal to that of all the four-year high school grades combined.

(2) The correlation between test scores obtained by three hours of mental testing and first year College grades is approximately twice as high as that between the average of all high school grades and the first-year College grades.

(3) When the engineering freshmen of 1919-20 are ranked from highest to lowest according to their mental test scores and the entire group divided into fourths, it is found that only 29.6 per cent. of the lowest fourth are now (1921-22) in College, whereas 70.4 per cent. of those who rank in the highest fourth are still in College.

(4) Of the students in this group who in their freshman year attempted to carry three courses simultaneously in science and mathematics 93.7 per cent. of the highest quartile obtained passing average in the three subjects, whereas only 5.2 per cent. of those in the lowest quartile obtained a passing average.

(5) The correlation between mental test scores is high in some subjects, e.g., 67% in chemistry, and low in others, e.g., 16% in woodwork, and 21% in forging. The difference in correlation should furnish a fair basis for guidance in the choice of courses.

(6) From the test scores and grades awarded in the past in any subject it is possible to calculate the grade which a student of any degree of intelligence should be expected to obtain. Such information furnishes a powerful stimulation to better scholarship, especially among those who rank high in intelligence.

Cordially yours,

EDWIN L. HOLTON,

Head, Department of Education,  
Kansas State Agricultural College,  
Manhattan, Kans.

---

ARTIFICIAL TEETH.—The harmonious in form, the symmetrical in arrangement, the pleasingly proportional in size and the harmoniously blended coloring, as found in nature at her best, should be our inspiration along aesthetic lines, but our real stimulation for achievement is the artless selection—if selection it may be called—of substitutes for natural teeth. It requires but half an eye to recognize the crude choosing at random in denture work as we find it.—K. K. Cross, D.D.S., *Journal of the N.D.A.*



# PHILLIPS' MILK OF MAGNESIA

"The Perfect Antacid"

**For Local or Systemic Use**

Caries, Gingivitis, Erosion, Stomatitis, Sensitiveness, Pyorrhoea  
are successfully treated with it.

Excellent as a neutralizer of Oral Acidity.

## PHILLIPS' PHOSPHO-MURIATE OF QUININE COMP.

Non-Alcoholic Tonic and Reconstructive

With marked beneficial action upon the nervous system. To be relied  
upon where a deficiency of the phosphates is evident.

New York **The Chas. H. Phillips Chemical Co.** London

*Canadian Agents—The Wingate Chemical Co., Ltd., No. 545 Notre Dame  
Street, Montreal, Canada, who will be pleased to send samples upon request*

The  
Original



Malted  
Milk



*Safe and reliable for the feeding of infants*

Used extensively by the medical profession for this purpose, and for  
invalid and convalescent feeding, for over one-third of a century.

*Samples prepaid upon request*

*Avoid imitations*

**HORLICK'S MALTED MILK CO.**

RACINE, WIS.

SLOUGH, BUCKS, ENG.

MONTREAL, CAN.

## Don't be Misled by Claims Against Teeth With Baked-in Pins

Do teeth for Vulcanite work require stronger pins than those in your Crown and Bridge Facings, which are baked-in the Porcelain?

A baked-in pin is securely held by the head of the pin and the shrinkage of the Porcelain in baking, forming an absolute anchorage.

All Justi teeth have baked-in pins.

Ask your dealer for Justi teeth.

Can we send you our tooth catalog?

H. D. Justi & Son  
Philadelphia Chicago

## And Now for Equipment

---

WHEN you have ceased to equip, you have ceased to progress. Whether in things of the mind or in physical things, the process must go on eternally—the replacement of the old with the new, a recognition of the law of evolution.

If our skill and talents are to have full expression, we must have the material helps—not make-shifts—but equipment that renders the highest service; that does not hamper and throttle our effort but supplements it and unfailingly carries on for us.

The time to equip is now, because no man of broad vision likes to do less than his best; and because the cost of equipment cannot be substantially less through a long period to come. The cost of production is now on a basis where further material reductions cannot be expected.

The natural source of equipment is the reputable dental dealer. He carries in stock the latest devices; he is at hand when parts are required; he maintains experts to fix or adjust anything that demands immediate attention. For his modest profit he gives full value in service.

The trend of modern equipment is towards efficiency and simplicity. The old idea of a multiplicity of articles hanging from the walls and taking up every inch of available space is obsolete. The useless gew-gaws are being discarded. The aim is to concentrate all details into units, simple in design, efficient in use, and expressive of real taste.

This company, through the leading dealers everywhere, is prepared to furnish such equipment. Its great factory was built for the purpose; its expert mechanics are at their posts. The demand for Electro Dental Units has grown steadily since this Unit was first shown a little over a year ago.



Production is fast approaching normal—both in Units, Senior and Junior, and in all of our other specialties.

The future never held so much promise for real dentistry as now. The field is limitless for the man who means to be mentally and physically equipped. We are growing busier every day equipping such men.

---

CAN WE SERVE YOU?

---

Electro Dental Manufacturing Co., Philadelphia

# FORHAN'S

## FOR THE GUMS

### *A Proper Dentifrice*



For cases that tend to pyorrhea, a proper dentifrice is Forhan's For the Gums.

Forhan's is exceptionally smooth and free from harsh substances that are inflammatory in effect when brushed under the margin of the gums. As a cleansing agent alone, Forhan's is a dentifrice which you may safely recommend.

In pyorrhea cases where gum irritation is pronounced, Forhan's For the Gums is used with marked success as an auxiliary to professional treatment. It contains an efficient percentage of Forhan's Astringent, and is therefore a valuable healing agent. Best results in these cases are obtained in connection with finger massage.

Forhan's For the Gums is on sale in drug stores everywhere.

Forhan's Astringent is not available to the public, and may be purchased by dentists only. Buy direct, using special offer coupon

*Formula, R. J. Forhan, D.D.S.*

**FORHAN'S LIMITED**  
489 St. Paul St., West, Montreal, Canada

*Canadian Selling Agents*

**MacLean, Benn & Nelson, Ltd.**  
489 St. Paul Street, West, Montreal

**Forhan's**  
**FOR THE GUMS**

Forhan's Ltd.,  
489 St. Paul St. West,  
Montreal, Canada.

Enclosed find two dollars (\$2.00) for which please send me special offer of:

- 1 \$2.00 bottle Forhan's Astringent. (½ oz.)
- 5 60c tubes (paste) Forhan's For the Gums.

Name .....

Address .....

City, State .....



# THE BOWROSE INSET SUCTION

(Patented)

## WHY

THE BOWROSE INSET  
SUCTION IS SUPERIOR  
TO ALL OTHERS

## BECAUSE,

being Inset, it is the means of procuring a perfect Vacuum and at the same time allowing the Denture to bed right into position before the suction takes effect.

Soft and comfortable, harmless to the tissues and lasts the life of the Denture.

It is constructed with a pliable metal mould which allows it to be adjusted to the most fragile ridge without fear of fracturing the model.

### No. 1 Uppers.

The only system that can be adapted to "V" Shape Palates successfully.

Adds little cost to your Dentures, but adds greatly to their efficiency.

The means of dispensing with wires and bands.

Its simplicity of attachment adds practically no extra time in making a Denture.

### No. 2 Lower

for wide flat ridges.

The Bowrose Lower Suction has indeed come as a great boon to the Dentist, having solved the difficult problem of a clean and efficient suction for the flat, ridgeless gum.

Fit them in your next Case and watch results and you will find a Bowrose in a case is worth two others riveted on.

### No. 4. Partial Lower.

Directions for Fitting the Bowrose "Inset" Suction

Fill the grooves with soft plaster, press into position and secure with pin. Before packing remove tin-foil, which is to protect the rubber from wax. After case is vulcanized remove metal moulds.

- |                           |      |        |
|---------------------------|------|--------|
| 1 Uppers . . . . .        | each | \$0.50 |
| 2 Lower . . . . .         | pair | .75    |
| 3 Lower . . . . .         | pair | .75    |
| 4 Partial Lower . . . . . | pair | .50    |

The Bowrose Inset Suction is being highly praised by every dentist using it.

FULL DIRECTIONS  
WITH EACH SUCTION



For Sale by Dealers Everywhere

SOLE  
AGENTS

The Dental Manufacturing Co., Inc.

220 West 42nd Street

NEW YORK CITY, U.S.A.

# NOVOCAIN

BRITISH MADE

---

## *The Original Cocaine Free—Local Anaesthetic*

---

Produces a perfect local anaesthesia, the duration of which is longer than Cocaine.

It is quite equal to Cocaine in anaesthetic power, while many times less toxic, and can be used in much larger doses in perfect safety.

Novocain is constant in its action, does not irritate the tissues, nor produce shock, cardiac, or respiratory failure, after pain, nor sloughing of the gum.

### Dental Tablets "E"

Novocain	-	-	-	0.02 gramme
Adrenalin	-	-	-	0.00005 "

Tubes of 20 tablets, 50c

One tablet dissolved in 1 c.c (17 minims) physiological Saline solution or Modified Ringer Solution furnishes a 2% Novocain solution. Injection of 1 to 2 c.c suffices for one or two extractions.

---

MANUFACTURED BY

**The Saccharin Corporation, Limited**  
London, England

---

*Literature and full Technique on request to*

**W. LLOYD WOOD**

64-66 Gerrard Street East. - - - TORONTO  
Canadian Agent.

# ROYAL VINOLIA TOOTH PASTE



**A British made dentifrice—a favorite with  
the Profession all over the Empire**

An honestly made dentifrice—free from faddism or extremes—that performs its work as a tooth cleanser efficiently, and satisfactorily. It is not subject to variation in any degree as we do not allow the high price of its ingredients to interfere with our formula being invariably carried out.

*All Druggists and Stores Sell  
Royal Vinolia Tooth Paste*

**Vinolia Company, Limited**  
London      TORONTO      Paris



## “SUCCESS” CASTING GOLD FOR CAST CLASPS, ETC.

In this alloy, strength and rigidity in the cast form has been attained without brittleness.

It is a gold-colored metal, and may be melted with the ordinary gas and air blowpipe.

The increasing demand for this gold fully justifies its name, “SUCCESS.”

MANUFACTURED BY

**WICKETT & SMITH CO.**  
**DENTAL GOLD MANUFACTURERS**

71 Lombard Street      -      -      TORONTO, CANADA

*Order through your dealer or direct. Price \$2.00 per dwt.*

# How Many ?

**H**OW many professional men realize the necessity of saving money during their years of activity ?

**F**EW men realize how easy it is to become financially independent !

**T**AKE for instance the man who can save \$100 per month. If he invests this regularly at 6% and compound the interest at the same rate, in 20 years he has a capital of over \$46,000. This capital will produce a yearly income of \$2,761,—enough to live on if necessary.

Why not provide for the future ?

We will gladly assist you in carrying out this plan.

**F. H. DEACON & CO.**

*INVESTMENTS*

75 Bay Street, Toronto

## SAL HEPATICA

Materially Aids Local Treatment in

## PYORRHEA

**BRISTOL-MYERS CO.**  
NEW YORK



When Writing Advertisers Mention Oral Health.





## ECONOMY *and* EFFICIENCY

Combined with its Prompt Solubility, Pleasant Taste and Odor render **HUX-SAL** "The Exceptional Antiseptic" **After Extractions** and in the treatment of **Pyorrhea**

*For further information write to the Canadian Agents :*

**THE LEEMING MILES CO.**

4 St. Lawrence Boulevard

MONTREAL

- - - -

CANADA

## Orthodontic Appliances and Supplies

Articulators

Swages

Broach Holders

Mandrels

Porte Polishers

Beutelrock Drills

Gates Glidden Drills

Burs

Hand Vises

Screw Plates

Draw Plates

Dies and Taps

Impression Trays,

*140 Different Sizes*

Seamless Bands,

*Copper and Aluminum*

Root Canal Reamers and  
Facers

Metallic Root Canal Points  
Crystallon Wheels and Den-  
tal Points

Acid Proof Cement Spatu-  
las

Agate Spatulas and Agate  
Instruments

**BLUE ISLAND SPECIALTY CO.**

BLUE ISLAND

- -

ILLINOIS

- -

U. S. A.

## See our "Red Seal" Accident and Sickness Policies Special Features offered to Dental Surgeons

Insure against  
loss of income  
through Accident  
or Sickness

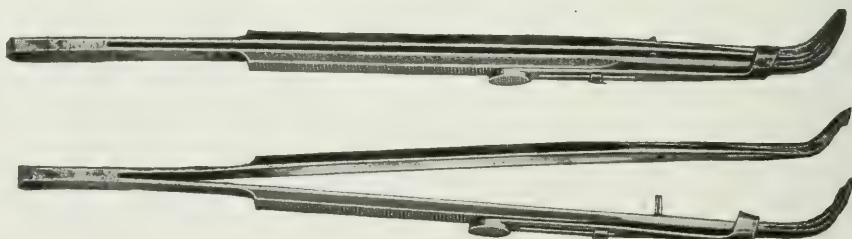


Policies cover every  
sickness and are  
entirely free from  
vexatious restric-  
tions

**Head Office: Company's Building, 61-65 Adelaide Street East, Toronto**

**BRANCHES—Quebec and Maritime Provinces..MONTREAL**  
**Manitoba and Saskatchewan.....WINNIPEG**  
**British Columbia and Alberta..VANCOUVER**

## LOCK BAND PLIER



For Placing or Removing Matrix Bands,  
Gold Bands, Polishing Strips, etc., etc.

Price	-	-	-	-	\$2.50
Price, without lock	-	-	-	-	1.75

INQUIRE OF YOUR DEALER

**J. W. IVORY**

618 Chestnut Street,

PHILADELPHIA, PA.

*What will be my income for 1921?*

*The*  
**“Temple-Pattison Company”**  
**CASH AND INCOME**  
**RECORD BOOK**

will give you the amount - - - TO A CENT

APPROVED BY THE

“Department of Dental Economics”

— at —

The Royal College of Dental Surgeons

Your net income is what measures your success!!

You will have to make in the future an accurate report of your profits to the Dominion Income tax collector.

BE PREPARED to pay your just taxation and NOT pay in excess of the REAL NET amount due.


This simple, practical and concise book is a splendid guide to the question :

**“Are My Fees on the Proper Basis?”**

*It is now ready for distribution; you are WELCOME to have one of these books sent to you (without obligation) for examination.*

PRICE - \$2.50

## S. S. White Golds for Casting

THE square ingot form of these alloys has proved its convenience in handling and melting. In addition to distinctive envelopes for each kind of casting gold, the ingots are stamped with the name of the gold and the Trade  Mark. With any approved technique in melting and casting, these golds will produce splendid results.

### *S. S. White Inlay Gold*

For hard, dense inlays; melts at 1720°F (938°C).

### *S. S. White Cast Inlay Gold No. 2*

For cast inlays that are to be burnished at the margins; melts at 1859°F (1015°C).

### *S. S. White Cast Denture Gold*

For rigid cast dentures, saddles, lingual bars, bridges, etc.; melts at 1738°F (948°C).

### *S. S. White Cast and Swaged Denture Gold, 20K*

For dentures that are to be swaged after casting; melts at 1729°F (943°C).

### *S. S. White Cast Clasp Gold*

For perfect fitting cast clasps; hard and springy; melts at 1855°F (1013°C).

Casting Golds are supplied in ingots 5-8 x 5-8 inch; weight 2 dwt. each.

They melt and flow readily under the flame of an ordinary gas and air blowpipe.

*Your Dealer will supply you*

**S. S. WHITE COMPANY OF CANADA, Limited**

264 College Street, Toronto

Wholesale Distributors in Canada for

**The S. S. White Dental Manufacturing Company**

Philadelphia U.S.A.

Ask for Booklet No. 2061, describing the entire line.

Free on request



## Value in Carborundum Tools Is a Matter of Efficiency

WHAT they will do is important to the user; how they look and how they are made are secondary if their performance is satisfactory. But there are two factors in rapid and accurate cutting that cannot fool the average eye---true running and accurate molding.

The cutting qualities, stability, and freedom from heat when in use can be demonstrated only by actual work.

**S. S. White Carborundum  
Wheels      Disks      Points**

prove their claims for cutting efficiency and true running wherever they are used.

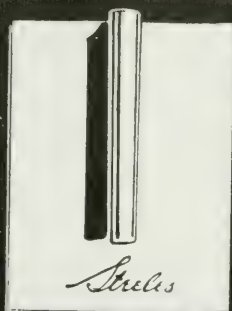
*If you want to know how they work  
it will cost you little to try them—if you  
want to know why they work so well,  
read the booklet "Carborundum Tools."  
Ask your dealer for a copy or write to us.*

Your Dealer Will Supply You

**S. S. White Company of Canada, Limited**  
264 College Street, Toronto

Wholesale Distributors in Canada for  
**The S. S. White Dental Manufacturing Company**  
Philadelphia, U.S.A.

It's the Crystal, not the color, that cuts



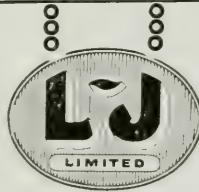
The registered trade mark

*Steele's*  
REG'D U. S. PAT. OFF.

is a guarantee of accuracy,  
workmanship and dependability.  
The absence of any one of these  
elements is a constant menace.

*The* COLUMBUS DENTAL MFG. CO.  
COLUMBUS, OHIO

**LESLIE JARVIS LIMITED**  
DENTAL SUPPLIES



SUPPLIES and EQUIPMENT

S. S. WHITE CO.  
RITTER DENTAL CO.  
L. D. CAULK CO.  
TRUBYTE TEETH  
STEELE'S FACINGS

**LESLIE JARVIS, Limited**

237 College Street, Toronto

Phone College 7086

*A campaign of education—No. 1*

## Help us spread the gospel of Clean Teeth

**T**HE Oral Hygiene Committee of the National Dental Association is actively conducting constructive propaganda along educational lines preaching the gospel of "clean teeth for health."

For years Dr. R. B. Waite has been actively working along these lines. He advocates oral hygiene because oral hygiene is preventive dentistry—the dentistry of the present. Let's all spread this gospel of progress and enlightenment.

*Dr. R. B. Waite's*

### ANTI-PY-O Dental Cream

fits in best with oral hygiene as it is being advocated because ANTI-PY-O best meets its requirements. Antiseptic and a thorough cleanser, it leaves the mouth refreshed, wholesome and helps eliminate dangerous bacteria.

**THE ANTIDOLOR MFG. CO.**

3 Main St. Springville, N.Y.



ANTIDOLOR MFG. CO.

3 Main St., Springville, N. Y.

On receipt of your professional card we will be pleased to send you special sample tubes of Dr. R. B. Waite's ANTI-PY-O Dental Cream, including a full size tube for your personal use.

Name.....

Address.....

City.....

**When Writing Advertisers Mention Oral Health.**



## *A Record of Nearly Twenty Years' Success in the Treatment of*



## **Putrescent Pulp and Root Abscesses**

**More Than Ten Millions  
of Treatments Per Year**

Ninety per cent. of cases, whether of long standing or acute, yield promptly to the bland and healing influence of Oxpara in the hands of the average dentist.

### **Simple and Definite Technic—No Complicated Guess Work**

Oxpara has brought the treatment of all forms of abscessed and putrescent pulps easily within the skill of every dentist, placing in his hands a safe, sane and sensible method of restoring diseased teeth to usefulness and preserving them in that condition for many years.

Oxpara is to-day, as for many years, the dependence of many thousands of able dentists, not only in America, where it is best known, but in every country in the world where modern dentistry is practised.

### **For the Isolated Dentist**

In districts remote from the activities of the research man and the specialist, Oxpara is truly a God-send, enabling the isolated dentist to preserve and restore millions of teeth that otherwise would necessarily be condemned to the forceps.

Since the introduction of Oxpara nearly twenty years ago, many so-called treatments have been devised, exploited, tested to the finish, and discarded, while Oxpara has gone steadily forward, constantly gaining in the confidence of the general practitioner.

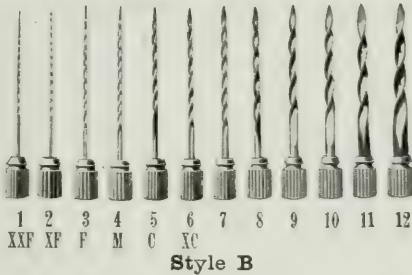
### **Directions in All Languages**

Oxpara and a full line of R. & R. specialties are sold by the leading dental dealers in your country. Consult them for additional information.

*The Ransom & Randolph Company*  
TOLEDO, O. U. S. A.

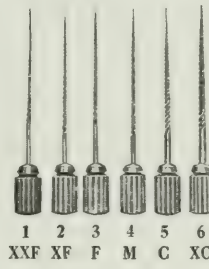


## Kerr BROACH REAMERS      Kerr PULP CANAL FILES



A spiral with sharp cutting edge tough and flexible. The most efficient method for root-canal treatment and essential for all good canal work.

Twelve graded sizes (1 to 12), style B as shown, also furnished in Style A for broach holder, Style D (2¾ in. Aluminum Handle), No. 2 Right Angle and No. 7 Hand Piece.



Kerr Pulp Canal Files are small tapering spirals with a fine, sharp file thread cutting edge especially designed for use in connection with the Kerr Broach Reamers.

After having opened up the canal with the Kerr Reamer, the files can be successfully used by rubbing up and down the canal wall or by giving them a turn into the canal and directly withdrawing.

Made in 6 sizes and 3 styles  
A, B, and D.

*Catalogue Mailed Upon Request.*

**DETROIT DENTAL MFG. CO. - Detroit, Mich., U.S.A.**

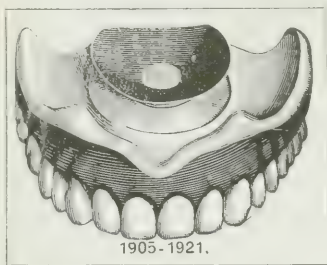
# For Your Service at All Times

Preserve good facial expression by using Corega on new dentures. The psychology of knowing that the denture cannot come out or cause embarrassment prevents the strained expression often seen on the faces of many denture wearers, caused by unconscious fear of accident.

**COREGA CHEMICAL CO.**  
208 St. Clair Ave. CLEVELAND, OHIO

*Let COREGA be for you a THIRD HAND holding work in place during operations and fittings.*





## Just One Moment, Doctor!

What are you paying for your retainers? Your 1921 dollar is just as big as your dollar of 1905 was, if spent for the "EUREKA."

Universally used, easily attached, your patients renew their own cups. Nothing to give you trouble in after years.

"The Fact That it Remains, Speaks for its Efficiency."

Upper or Lower, \$2.50 Per Box—Half Doz.  
At Best Dealers Everywhere.

Eureka Suction Co. - Loudonville, Ohio.

## Without Pain---

desensitizes dentine and devitalizes pulp—that's what Dearborn Nerve Paste will do.

On direct exposure, one application is sufficient. When dentine is too sensitive to excavate, a second application is sometimes necessary. The first application will obtund the most sensitive dentine in four to six hours.



## Try Dearborn Nerve Paste

without cost to you. If you like it, you pay \$3.35 in Canada for it. If you don't, send it back and it won't cost you a cent. You'll be surprised and pleased with the results. You will be able to work faster and do more efficient work. Your supply dealer has it in stock. He'll send you a jar on trial. If he happens to be out of it, send direct to us and give us his name. *Make a note of this now so you won't forget to include it in your next supply order.*

HALL DENTAL SUPPLY COMPANY  
222 N. Wabash Avenue - - Chicago, Ill.



The attention of the Dental profession is directed to the improved quality of Pink Rubber we are now offering, embracing the following essential features:

- ¶ Closer resemblance to the color of the Natural gum.
- ¶ Greater strength, capable of making an "All Pink" denture.
- ¶ More susceptible to a high polish.

ORDER FROM YOUR DEALER OR

**E. J. McCORMICK RUBBER CO.**

(Division Lodi Corporations)

LODI, N.J.

# One Legged Dentistry!

"One Legged Dentistry" is the kind that doesn't go ahead; the kind that does not avail itself of modern methods; the kind that keeps right on in the same old rut, that holds back its employer from being the success he ought to be.

"One Legged Dentistry" has ruined more ambitions than any other cause. We do not wish to be personal, but if you are practicing any form of dentistry without the aid of a general anesthetic, you are practicing "One Legged Dentistry."

Imagine what your practice would be if all the "hurt" was removed. What would it mean to you in making your work easy? And, more important, what would it mean to your patients and their friends? And finally, wouldn't it help your practice to have these friends of your patients become your patients? Of course it would.

What, then, is to be gained by failing to avail yourself of proven methods? Skepticism is a fine thing in small doses, but don't let it gain control. We offer you a safe, reliable anesthetic that has been a servant to the Dental Profession for 20 years. Its cost is really

trifling. The ease with which you can become expert in its use is astounding. It is SOMNOFORM.

Somnoform has helped thousands of dentists become successful, financially and professionally. Keep your natural skepticism, but send the coupon for our booklets. They should be in your library, and they will tell you what SOMNOFORM can do for you and what it has already done for others.

The books will be sent you gratis, and they represent no sort of an obligation on your part.

Right now is the proper time to do it.

Stratford Cookson Co.

PHILADELPHIA, PA.

42nd St. at Ludlow.

I do not practice  
"ONE-LEGGED DENTISTRY,"

Send Me Your  
SOMNOFORM Books Gratis.

Name .....

Address .....

Dealer .....



# RIGHT NOW

ARTICULATORS  
 BLOWPIPES  
 BOILING BURNERS  
 BROACH HOLDERS  
 BRUSH WHEELS  
 BUFFALO BROACHES  
 BUNSEN BURNERS  
 CASE HEATERS  
 CONE SOCKET HANDLES  
 COTTON HOLDERS  
 FELT WHEELS AND  
 CONES  
 FLASKS  
 FLASK PRESSES  
 FOOT BLOWERS  
 GASOLINE GAS OUTFITS  
 GOLD FILES  
 HEATING TRIPODS  
 PLASTER KNIVES  
 PLASTER SPATULAS  
 RUBBER FILES  
 SOLDERING BLOCKS  
 SWAGING ANVILS  
 VULCANIZERS  
 and  
 PUSCURE

Buffalo Dental Mfg. Co.

BUFFALO, N.Y.,

U.S.A.

as much time and money is being spent on the proper equipping of Dentists' laboratories as is being spent on beautifying Dental offices.

And why not?

Of course, your patient rarely sees your laboratory, but you see it every day, and there is no reason why it should not reflect you just as much as your office does.

How can you expect to maintain your sense of cleanliness and order if you divide your time between beautifully equipped and spotlessly clean operating room and an unkept laboratory equipped with a lot of rusty old junk?

Take a good look at your laboratory, and we'll venture to say you will find that fully fifty per cent. of the equipment is not only obsolete, but is actually worn out.

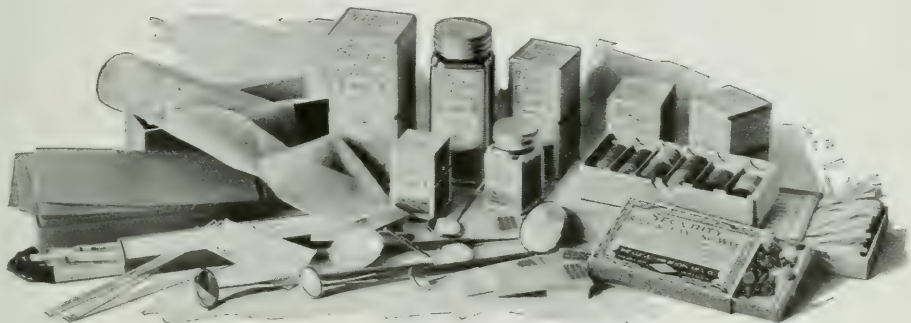
We are specialists in laboratory equipment.

We have catalogs and booklets covering our line of prosthetic apparatus, and we would like to send you literature concerning the items you decide to replace.

Which shall it be?



## Recent Additions to the Clev-Dent Line of Dental Products



To the already extensive line of dental products bearing the trade-mark, **Clev-Dent**, as a sign of their origin and quality, a number of new items have recently been added. These include new operating instruments and appliances, as well as many of the every-day necessities of practice. Those now ready for distribution include:

**Pulp Canal Cleansers**

**Mouth Mirrors**

**Celluloid Strips**

**Polishing Strips**

**Paper and Cloth Disks**

**Base-Plate Wax**

**Rubber Dam**

**Security Wax Cones**

**Automatic Pluggers**

**Dr. Graebner's Matrix**

**Dr. Hollenback's Carvers**

**Perry-Black Separators**

**Dr. Bridge's Pliers**

**Whitney Flask No. 20R**

**Donham Flask No. 22A**

**Tench-Donham Flask No. 22C**

**Dr. Lucas' Curettes L. H. and D. E.**

*The Clev-Dent Catalog will be sent on request*

**THE CLEVELAND DENTAL MFG. CO.,  
CLEVELAND, OHIO, U.S.A.**



**CANADIAN SELLING AGENTS  
NATIONAL REFINING COMPANY,  
34 Ross Street, Toronto.**

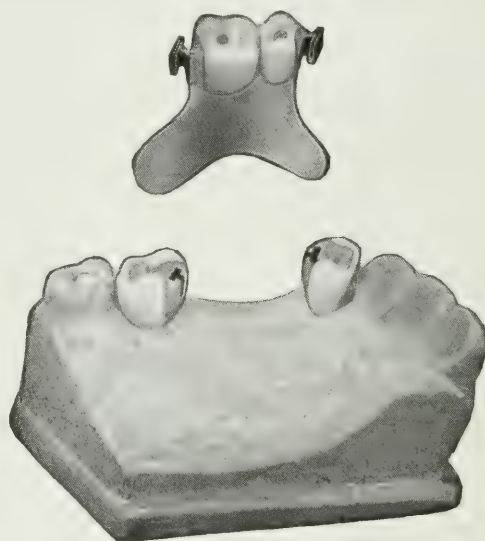
# Removable Bridgework

*Strong*

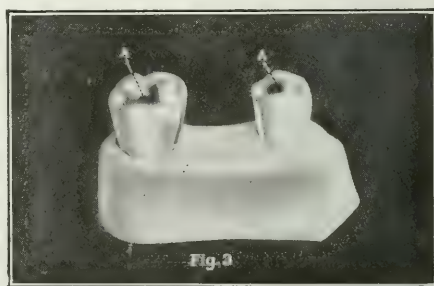
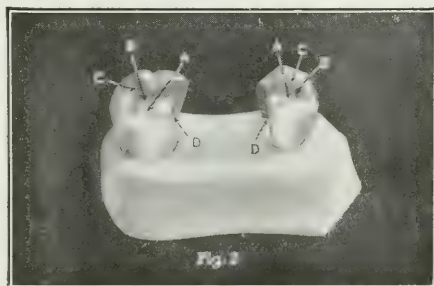
*Sanitary*

*Springy*

*Adjustable*



Using Brown and Sorensen Attachments



In the preparation of these cavities, which are of the compound types (Fig. 2), care should be taken to have each finished inlay occupy approximately three-fourths of the area of the occlusal surface of the tooth, according to the requirements of the particular case on hand (Fig. 3A).

**We Shall Be Pleased to Explain This Technique in Detail.**

*Send plaster impression and wax bite with  
inlays in position and we will do the rest*

## ALLEN & ROLLASTON

2 COLLEGE STREET, TORONTO

# You Need an Assortment of Trubyte Crowns

*One of these shown here will just meet your requirements.*



Trubyte Crown Assortment 384



Trubyte Crown Assortment 330



Trubyte Crown Assortment No. 1

**Why write words when pictures talk? These illustrations show there is a Trubyte Crown Assortment for every office, large or small. Which best fits your practice?**

*Assortment 384—384 central, lateral, cuspid and bicuspid crowns.*

*Assortment 330—330 central, lateral, and cuspid crowns.*

*Assortments No. 1 and 2—100 crowns each, different moulds and shades.*

**See these Trubyte Crown Assortments at Your Dealer's.  
Then Get the One You Need.**



**THE DENTISTS' SUPPLY COMPANY  
220 WEST 42nd STREET, NEW YORK, N. Y.**



# CHICAGO GRADUATE SCHOOL OF DENTISTRY

333-335 North Michigan Avenue : CHICAGO, ILLINOIS

## *Schedule of Classes for Jan., Feb. and March, 1922*

- I. January 3 to 7, inclusive** ..... **Oral Surgery.**  
 Block Anesthesia; Nitrous Oxid-Oxygen Anesthesia; Radiographic Interpretation; Extraction of Teeth, together with Surgical Principles and Technic; Preparation of Oral Tissues for Artificial Dentures. Arthur E. Smith, D.D.S., M.D.; Robert R. Bosworth, D.D.S.; Frederick F. Molt, D.D.S.; Howard C. Miller, D.D.S.  
**Fee.....\$100.00**
- II. January 9 to 14, inclusive** ..... **Oral Radiography.**  
 Oral Radiographic Technic and Interpretation, including Dark Room Procedure and Machine Management, leading to the Production of Interpretable Radiograms. Special Lectures on Physical Diagnosis in connection with Clinical and Radiographic Findings. Frederick F. Molt, D.D.S.; Prof. E. C. Jerman; Arthur E. Smith, D.D.S., M.D.; Vaughn L. Sheets, M.D., F.A.C.P.  
**Fee.....\$100.00**
- I. January 16 to 21, inclusive** ..... **Oral Surgery.**  
 (Same Course and Instructors as outlined in Class of January 3 to 7, inclusive.)  
**Fee.....\$100.00**
- III. January 23 to 28, inclusive** ..... **Porcelain Veneer Crowns.**  
 Simplified Method of Tooth Preparation; Accurate and Dependable Impression and Bite; Porcelain Building and Carving; Definite Color Laying Technic with Charts. A. H. Schneider, D.D.S.  
**Fee.....\$100.00**
- I. January 30 to February 4, inclusive** ..... **Oral Surgery.**  
 (Same Course and Instructors as outlined in Class of January 3 to 7, inclusive.)  
**Fee.....\$100.00**
- IV. February 6 to 18, inclusive** **Crown Bridge and Inlay Technic as applied to both Fixed and Removable Bridge Work.**  
 Cavity Preparations (upon Vital Teeth); Wax Patterns; Investing; Proper Elimination of Wax as applied to Different Waxes and Investment Materials; Casting; Fitting; Construction and Baking of Porcelain Tipped Dummies; Proper Solder Joints; Interproximal Spaces and Dental Anatomy as applied to Pontacs or Dummies; Fundamentals of Impression Taking; Articulation and Occlusion; Carving of Wax relative to Application of Proper Dental Anatomy as applied to Abutments, Inlays and Pontac Construction. Theodore W. Maves, D.D.S., Minneapolis, Minn.  
**Fee.....\$200.00**
- V. February 20 to March 4, inclusive** ..... **Full Denture Construction.**  
 This course will be thorough and practical in every respect, covering Mouth Examination and Classification; Impression Taking; Restoration of Facial Contours; Selection of Teeth; Correct Occlusion; Investing; Packing and Vulcanizing; Grinding of Teeth upon Articulator and in Mouth; Rebasement Technic, etc. Lester I. Furnas, D.D.S., Cleveland, Ohio.  
**Fee.....\$200.00**
- VI. March 6 to 11, inclusive** ..... **Periodontia.**  
 Prophylaxis and Pyorrhea Treatment; Occlusion Correction; Restoration of Tooth Form; Medications; Instructions on Home Care of the Teeth. F. H. Skinner, D.D.S.  
**Fee.....\$100.00**
- I. March 13 to 18, inclusive** ..... **Oral Surgery.**  
 (Same Course and Instructors as outlined in Class of January 3 to 7, inclusive.)  
**Fee.....\$100.00**
- II. March 20 to 25, inclusive** ..... **Oral Radiography.**  
 (Same Course and Instructors as outlined in Class of January 9 to 14, inclusive.)  
**Fee.....\$100.00**
- I. March 27 to April 1, inclusive** ..... **Oral Surgery.**  
 (Same Course and Instructors as outlined in Class of January 3 to 7, inclusive.)  
**Fee.....\$100.00**

### **FIVE WEEKS' POST-GRADUATE COURSE.**

**January 30 to March 4, 1922.**

This course is designed to meet the demands of the general practitioner who is desirous of broadening his knowledge and obtaining instruction in the modern and accepted procedures. Grouped in this way they are available at less expense than taken separately. The comprehensive scope of the work, as well as the calibre of the instructors, is accentuated.

#### **Subjects:**

Course I. Oral Surgery.

Course II. Oral Radiography.

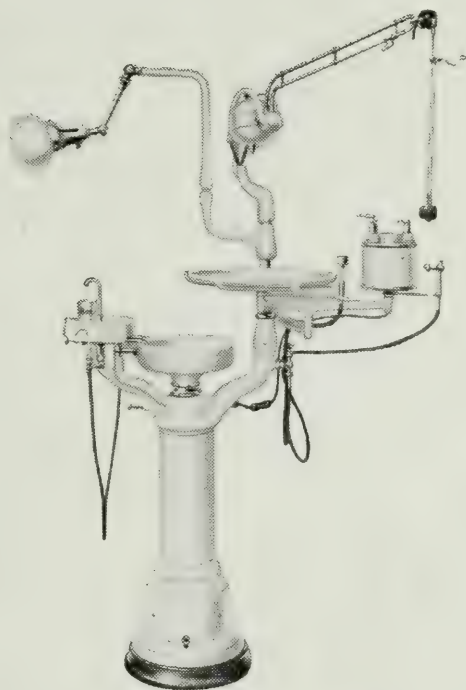
Course IV. Crown, Bridge and Inlay Technic as applied to both Fixed and Removable Bridge Work.

Course V. Full Denture Construction.

**Fee.....\$400.00**

(A detailed outline of any of the courses will be sent upon request.)





## The Weber Unit Model "D"

This Model includes the Pedestal, Fountain Cuspidor, Sub-base, Pipes for Gas and Air, Bracket and Table, Dental Light, Adjustable Bunsen Burner, Weber Spray Heater, Cut-off, and Chip-blower, all on arms with taper-socket making them absolutely rigid and adjustable to the most convenient position. All metal parts are brass and aluminum. The Unit can be ordered less any of the parts. Prices range from \$285.00 to \$360.00. Beautiful illustrations of the various Models and further information on request.

---

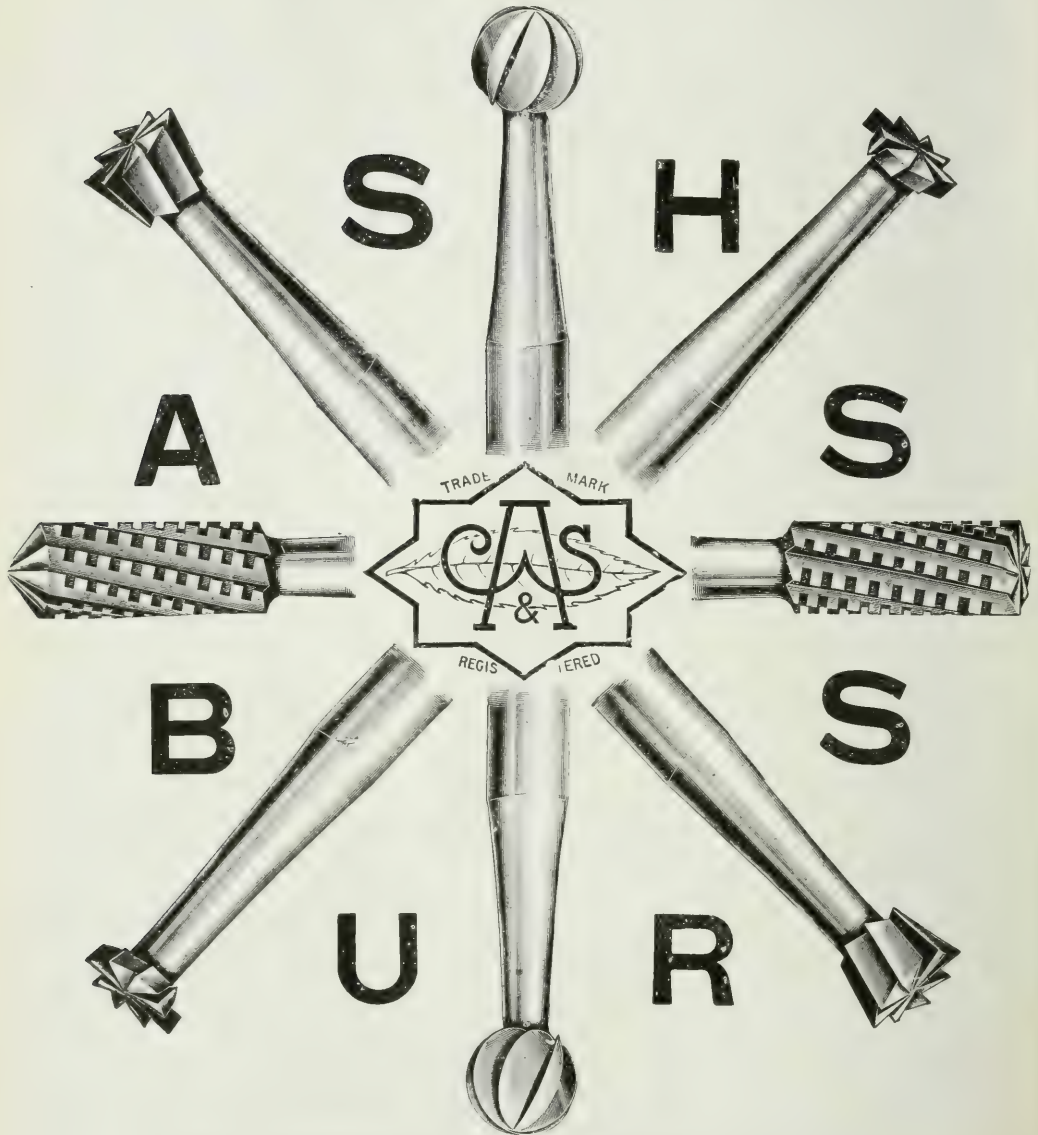
---

===== The =====

**Weber Dental Manufacturing Co.**

CANTON    ::    OHIO

# POINTS OF EFFICIENCY



**WELL TEMPERED, MATHEMATICALLY TRUE,  
KEEN, EVEN and REGULAR BLADES.**

May be obtained through your Dealer or Direct

**CLAUDIUS ASH SONS & CO. (of Canada) LTD.**

11 and 13 Grenville St. - Toronto

515 to 519 Somerset Block - Winnipeg

41 King William St., - Hamilton

When Writing Advertisers Mention Oral Health.



## RADIOGRAPH GUIDANCE FOR EVERY DENTIST

**L** EAVING too much to his "experience" or "judgment" has proven a poor practice-builder for many a dentist. With present-day legislation, involving more and more his professional responsibility, the modern dentist is turning to the X-ray as a means of eliminating the many uncertainties which are met with in everyday practice.

As a properly made radiogram serves as a check on the accuracy of his diagnosis, so the Ritter Dental X-ray Unit provides him the means of obtaining that radiogram—quickly, economically and without any guess work.

A Ritter X-ray Unit will make yourself and your patients a Christmas present that will last through the years. Why not arrange with your dealer for a demonstration to-day?

Catalogue Upon Request.

**RITTER DENTAL MFG. CO., Inc.**  
ROCHESTER, N.Y.



# ANNOUNCEMENT

---

*Wholesale*

*and*

*Retail*

We wish to announce to our many friends that we are prepared to fill all orders for Dental Supplies.

Ask for Catalogue and Prices.

National Refining Co.  
LIMITED

34 Ross Street

Toronto

Ontario



## Inside the Mouth---As Well as Outside---

*whenever, and wherever* there is congestion, inflammation, threatened or actual abscess, the prompt, liberal use of



mitigates suffering of Patient and saves time for the Dentist. . . .  
*Try Antiphlogistine on a piece of cotton or lintine, placed inside the mouth, over focus of inflamed area. Non-poisonous, effective, pleasant.*

*“There’s only ONE Antiphlogistine”*

THE DENVER CHEMICAL MFG. CO., MONTREAL, CAN.

Branches: LONDON, SYDNEY, BERLIN, PARIS, BUENOS AIRES, BARCELONA, MONTREAL

THE ORIGINAL ZINC CHLORIDE ANTISEPTIC

ITS ATTRACTIVE FLAVOR  
APPEALS TO CHILDREN

**LAVORIS**

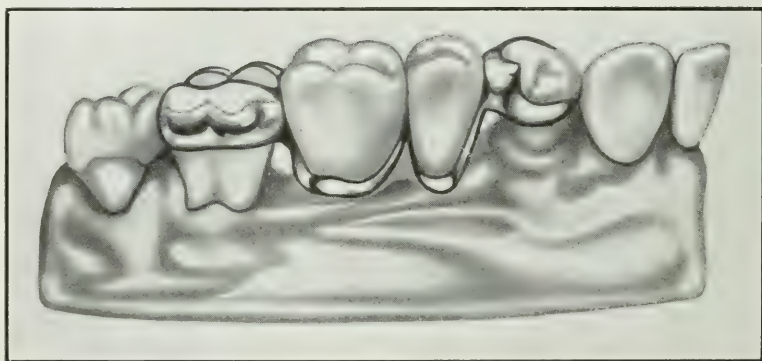
ITS USE  
ESTABLISHES  
A GOOD HABIT

LAVORIS CHEMICAL CO.,  
MINNEAPOLIS, MINN.

THE HEALING MOUTH WASH

When Writing Advertisers Mention Oral Health.

# An Idea plus Experience



*Dr. Nesbitt's ideas are carried out in every detail by an expert mechanic when you refer a case to this laboratory*

Efficient laboratory service for the dental profession to meet the most exacting requirements of the Modern Practice of Dentistry. All the latest methods which have proved satisfactory in practice are used in this laboratory.

## **C. L. DALY, Dental Laboratory**

*Established 1903*

Member of Cummer Prosthetic Course, 1914

Suite 56      -      2 Bloor Street East      -      Toronto

# Pyorrhoea-Alveolaris

In the treatment of Pyorrhoea-Alveolaris many dentists augment local treatment with Sal Lithofos used systemically.

## SAL LITHOFOS

The ideal Laxative and Uric Acid Eliminator, at all Drug Stores.

Wingate Chemical Company

545 NOTRE DAME W.

MONTREAL



When you start your day with a cup of steaming, fragrant coffee, you owe most of the pleasure derived from it to Brazil. If your breakfast table is a mahogany one, that may also have grown in Brazil at one time (as a tree, not as a table). And—oh, yes, Brazil gives us Brazil nuts. Of course, this is not the slang version, because a "nut" wouldn't know enough to use

## "GOLDDUST" RUBBER

(Trade Mark Reg. U.S. Pat. Office)

This issue finishes the series of "Trips Round the World with 'Golddust.'" To those who have been so unfortunate as to miss the other eleven "trips," we repeat our reasons why you should use "Golddust" for your plate-making: Because it is exceptionally strong, plates made with it are absolutely non-porous, and it is both easily manipulated and vulcanized. It is of low specific gravity, therefore economical to use, and with the minimum of effort you can give it that beautifully lustrous high polish which shows the admixture of finely pulverized aluminum with the rubber. Send the coupon before the year "goes out."

### PRICES:

\$4.50 per pound. \$2.25 per half pound.  
1/5th pound sample box (about 7 sheets) \$1.00.

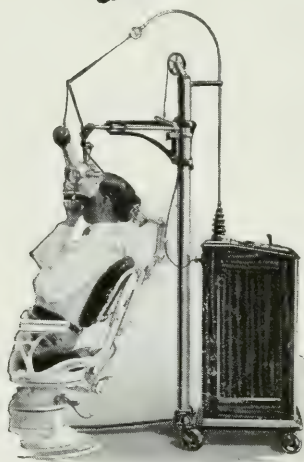
ATLANTIC RUBBER MFG. CORPORATION

239-243 Fourth Ave., Dept. 21-12 New York, U.S.A.

Dept.  
21-12  
Enclosed  
\$1.00 for  
Sample box  
of "Golddust"

Dr. ....

When Writing Advertisers Mention Oral Health.



## A Definite Advance In Dental X-Ray Apparatus

The Coolidge Tube is capable of absolute control, but until recently this possibility was not realized, due to the fact that apparatus to energize the tube was not capable of overcoming fluctuation in line voltage. With every line fluctuation there was a considerable variation in the quantity of X-Rays delivered by the tube. Obviously this is an annoying factor and prevents getting radiographs of uniform diagnostic quality.

This is now overcome, however, by the *Victor-Kearsley Stabilizer*, which is an *exclusive feature* in the

### Victor Stabilized Dental X-Ray Unit

With this stabilizer in the circuit, the operator knows that his tube current will remain constant, in spite of fluctuations in the line supply. If he uses the correct technique he is assured a good radiograph, for the Victor Unit will operate consistently.

Truly the "last word" in dental X-Ray apparatus — and there is no premium to pay to enjoy its advantages.

VICTOR X-RAY CORPORATION, *Dental Department*

236 South Robey Street, Chicago

THE TEMPLE-PATTISON COMPANY, LTD.

*Sales Distributors for Ontario and Western Provinces*

Toronto

London

Winnipeg

Regina

Calgary

Edmonton

Vancouver





# Finding an abscessed tooth with Cameron's Dentalamp

© This illustration gives you an accurate idea of how every blind abscess appears in every patient's mouth when transilluminated with the 100 candle-power Cameron's Right Angle Dentalamp. The shadow indicates a typical infection of a lower left molar.

Healthy areas always show pink and clear when transilluminated with Cameron's Dentalamp.

Shadows in the dental process are always due to an excess of hemoglobin because of a congestion and oxidation of red blood corpuscles caused by a disturbance of the circulatory system in the area, and are never caused by root canal fillings or chemicals used in treating the teeth.

We will pay a reward of \$100 to the first dentist who can cause a shadow (without infection) in the dental process with any chemical or filling used in treating root canals.

Our book "Diagnosis by Transillumination" explains the technique and is provided Free with the outfit. In addition to the diagnostic features, Cameron's Dentalamp furnishes you with all the clean, cool light you want in the patient's mouth, and a life-time of service and satisfaction.

The complete Cameron's Dentalamp (Cool X-Raylite Model) includes Potential Reductor Unit for either alternating or direct current. Eight-foot silk covered cord with connections, two Straight Dentalamps, two Right Angle Dentalamps, two

complete Cameron's Detachable Mirrors—all packed in velvet-lined Fabrikoid carrying case.

Complete 110-volt Std. Socket Model \$30.00.

Please ship at once as checked below on 10 - days' Trial, one complete Cameron's Dentalamp (Cool X-Raylite Model), and one copy of book "Diagnosis by Transillumination." If not entirely satisfactory to me, I may return the outfit at the end of ten days at your expense, and you hereby agree to refund the full amount paid. Prices—American Exchange.

Check enclosed for \$30.00 ☐ Send outfit C.O.D.

Name .....

Address .....

City ..... Prov. ....

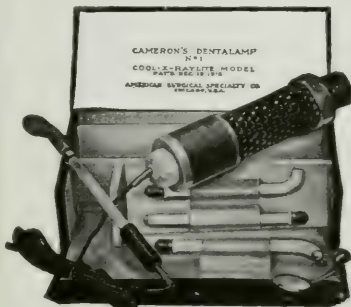
220-volt Standard Screw Socket Type ..... \$35

For Delco or similar system ..... \$35

(U.S. Army Field Service Model) Std. Batteries ..... \$20

Foreign "Bayonet Socket" Type.

110-volts ..... \$35 220-volts ..... \$40



When Writing Advertisers Mention Oral Health.

O.H.  
112.  
Cameron's  
Surgical  
Specialty Co.,  
Suite 506  
6 East Lake St.  
Chicago, U.S.A.

You Take No Risk. Fill in and Mail the Coupon Now.

# Wappler Empire Model No. 1

Output 50 milliamperes, 5 Benoist



Slightly larger  
than preced-  
ing model.  
Eight inch  
Gap.

Dimensions of  
Cabinet:  
23x26x41 in.

Write for Cat-  
alogue and In-  
formation to

Sole Canadian  
Agents

Ingram & Bell, Limited

256 McCaul Street

Toronto, Can.

**Announcement**

**Joint Convention**

of the

**Canadian Dental Association**

and the

**Ontario Dental Association**

at the

**KING EDWARD HOTEL**

**Toronto**

**May 15, 16, 17, 18, 19, 1922**



A programme of unique excellence  
is now in course of preparation.

RESERVE THE DATES

# Anesthesia plus Antisepsis

That is what you get when you use Apotheresine—the Parke, Davis & Co. local anesthetic. Unlike cocaine and another much more popular synthetic anesthetic, Apotheresine is a powerful antiseptic. Pus-producing organisms are promptly killed in the presence of comparatively weak solutions of Apotheresine.

In oral and dental surgery, asepsis is, by the very nature of things, frequently impossible. Tissues are bathed in the germ-laden secretions of the mouth. Antiseptics are therefore essential.

Apothesine is unique in that it yields nothing to its competitors in the local anesthetic field in efficacy and freedom from toxic effects. At the same time it is vastly superior as an antiseptic.

By means of one injection of Apotheresine you accomplish two objects: you anesthetize the field of operation; you introduce a powerful non-irritating antiseptic.

**Parke, Davis & Co.**

## APOTHESINE TABLETS, DENTAL (H. T. No. 218)

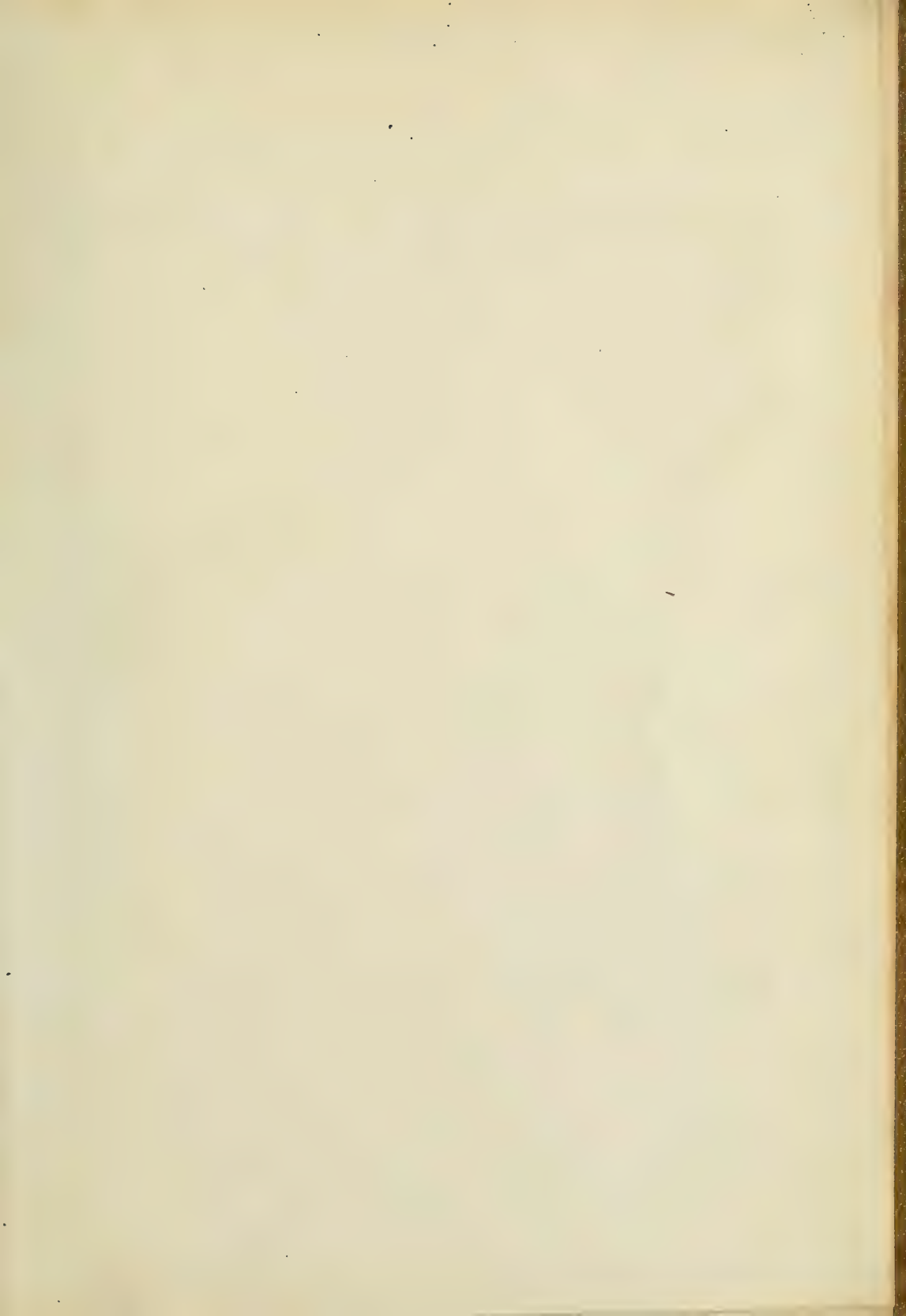
One tablet in one cc of water makes a 2% solution of Apotheresine in Adrenalin 1:40,000.

## APOTHESINE SOLUTION

Supplied in 20-cc vials and in 2-ounce bottles.











This journal must be  
returned to the Dental  
Library by the last date  
stamped below:

FEB 15 1991

APR 29 1991



1921  
v. 11  
#2  
University of Toronto

Library

H. R. A.

DO NOT  
REMOVE  
THE  
CARD  
FROM  
THIS  
POCKET

Acme Library Card Pocket  
Under Pat. "Ref. Index File"  
Made by LIBRARY BUREAU



